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CRYSTAL PALACE SHOW ISSUE



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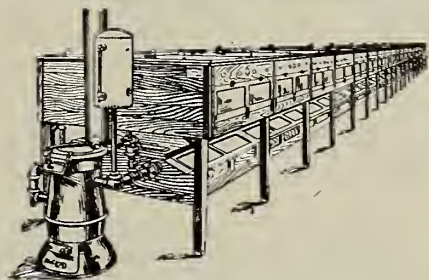
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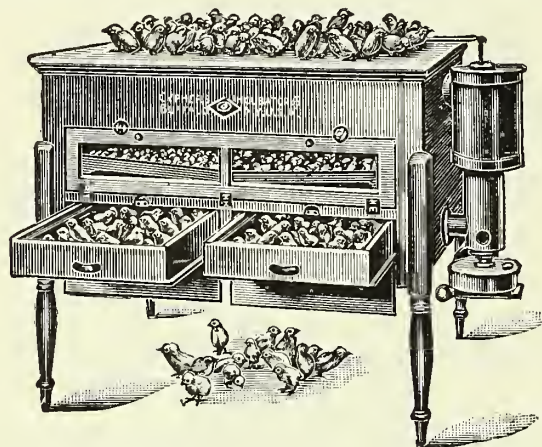
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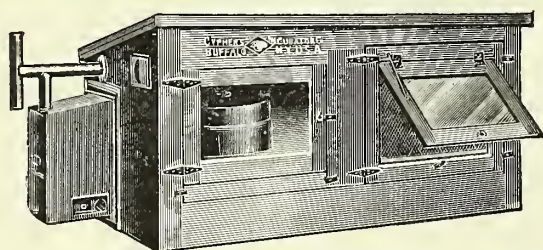
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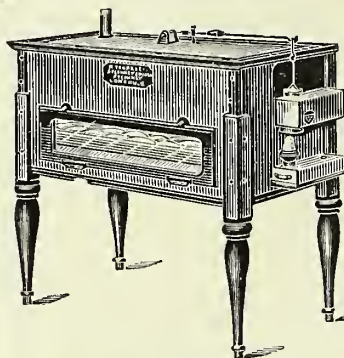
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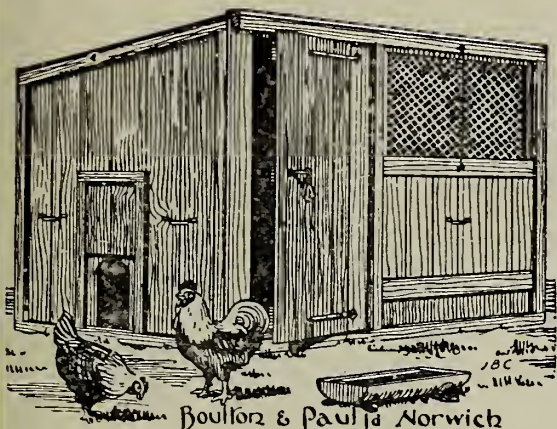


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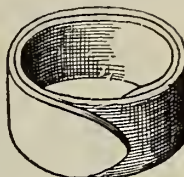
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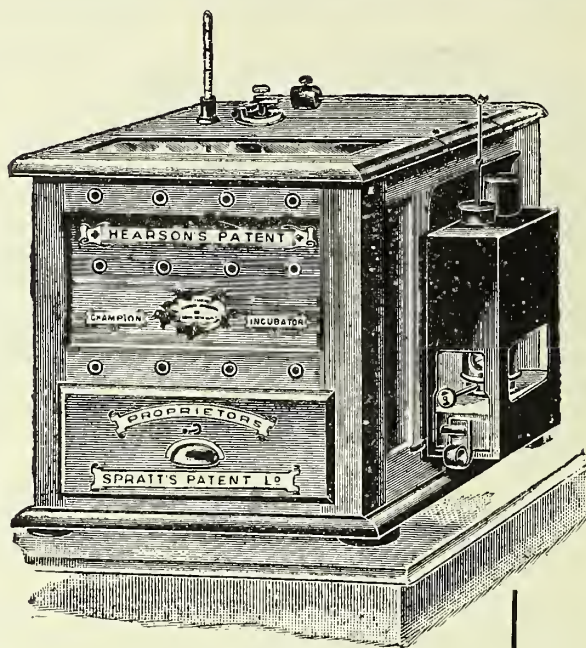
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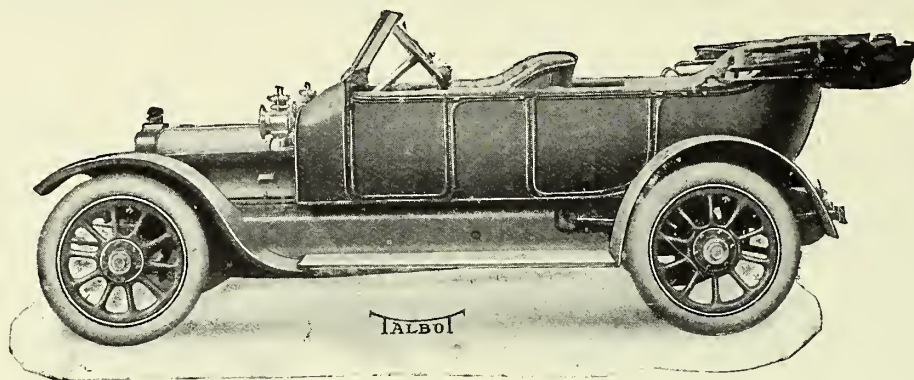
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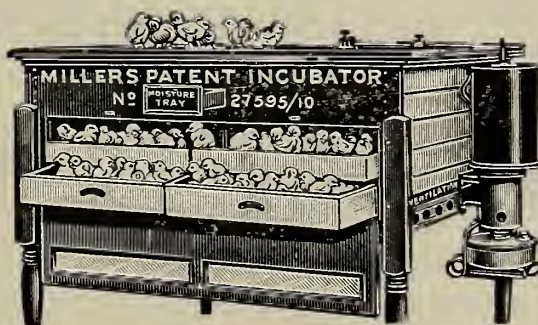
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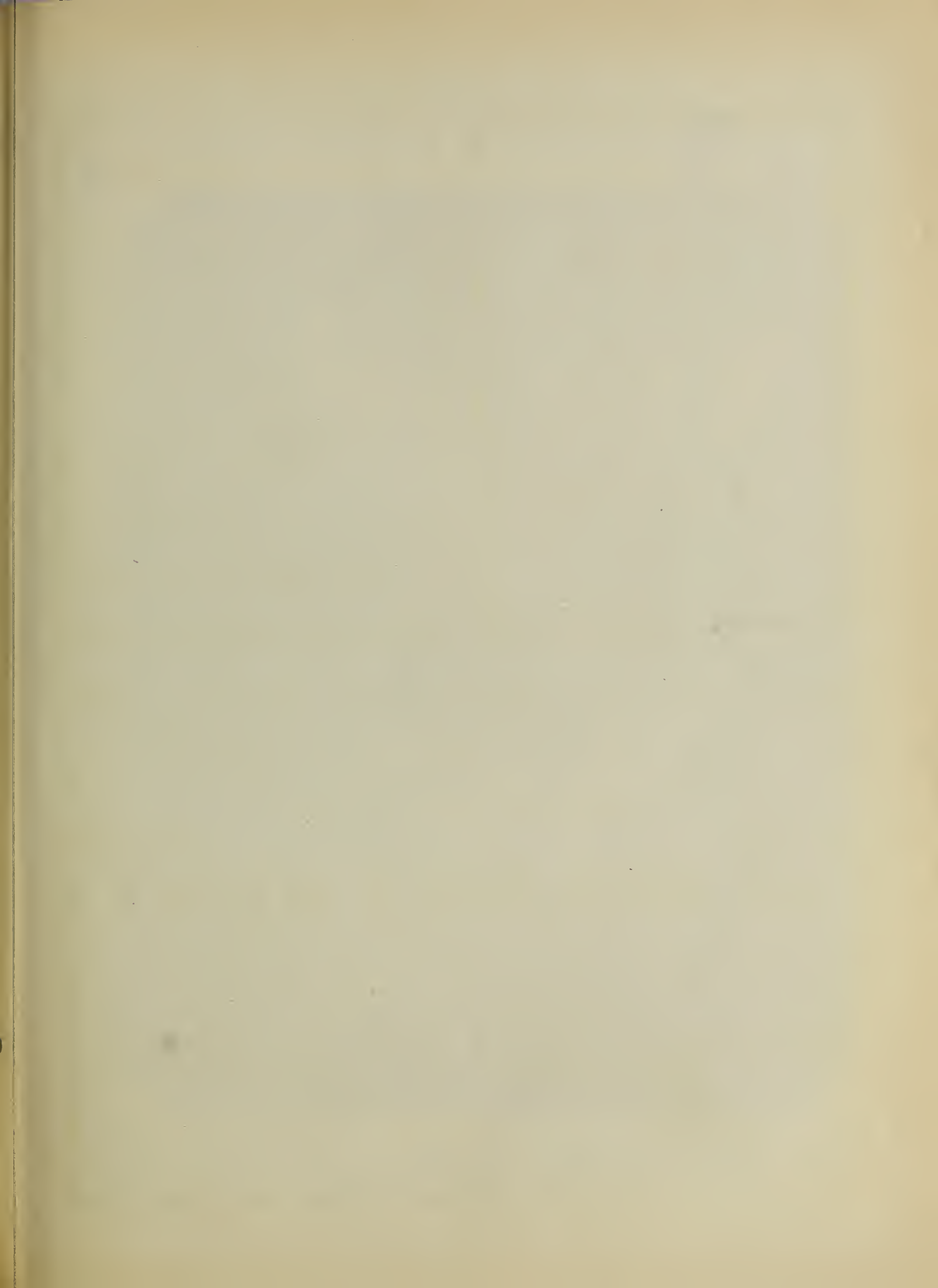
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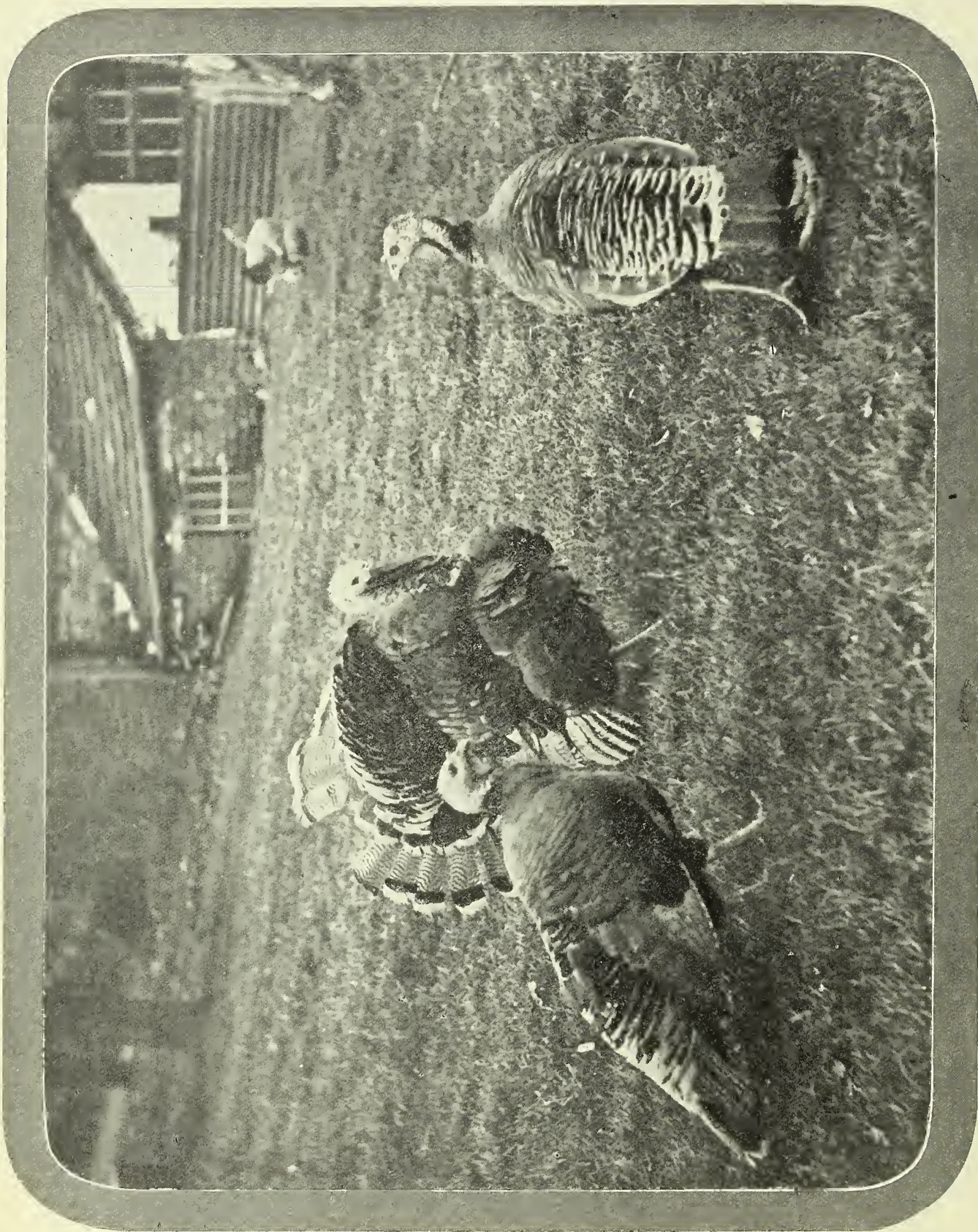
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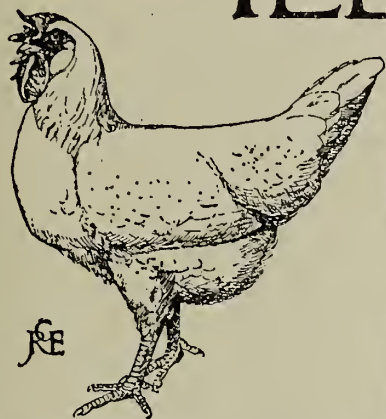




FARM-YARD GOSSIP.

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THE ILLUSTRATED POULTRY RECORD



Vol. VI.—No. 2.

November 1, 1913.

Monthly, Price Sixpence.

DIARY OF THE MONTH.

EDITORIAL NOTICES.

ATLANTIC HOUSE, HOLBORN VIADUCT, LONDON, E.C.

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The Editor would like to hear from readers on any Poultry Topics, and all Queries addressed to the paper will be answered by experts in the several departments. The desire is to help those who are in difficulty regarding the management of their poultry, and accordingly no charge for answering such queries is made.

The Annual subscription to the ILLUSTRATED POULTRY RECORD at home and abroad is 8s., including postage, except to Canada, in which case it is 7s. Cheques and P.O.O.'s should be made payable to the ILLUSTRATED POULTRY RECORD.

The ILLUSTRATED POULTRY RECORD is published on the first of every month. Should readers experience any difficulty in securing their copies promptly they are requested to communicate immediately with the Editor.

The latest date for receiving advertisements is the 20th of the month preceding date of issue.

The utmost care is exercised to exclude all advertisements of a doubtful character. If any reader has substantial grounds for complaint against an advertiser he is requested to communicate at once with the Editor.

The Land—An Omission.

A large amount of interest has been centred during the last month in the Report of the Land Enquiry Committee. With the party political aspects we have nothing in common. Such questions may be the shuttlecock of conflicting interests and opinions. That does not concern us. We desire, however, to point out two very serious omissions in this report, first, that whilst there are a few mentions of poultry, these are sparse in the extreme. Anyone reading this book would imagine that the value of this branch of live stock was infinitesimal, instead of being of considerable importance. Secondly, that so far as we have been able to trace no mention is made of the serious and widespread evil resultant from fox preservation in so far as the loss arising to poultry-keepers is concerned. Much is said about the depredations of winged and ground game, and even deer come in for condemnation, but it is evident that no one on the Committee which prepared this report has any knowledge of or interest in the poultry industry or have received evidence upon a question which is very pressing and is doing a vast amount of injury all over the country. It certainly behoves poultrymen to bestir themselves in order to ensure that if any legislation should be proposed to deal with game, the fox shall be put in his proper place, and hunts made to keep him within bounds, as well as to foot the bill when and where he runs a-mok among the hens. Perhaps it is almost sacrilege to speak thus of King Reynard, but unless something is done poultry-keepers will give him short shrift, more especially as the industry develops.

The Passing of the N.P.O.S.

We always regret the termination of any organisation which has been engaged in promotion of progressive work. Such is certainly the case with poultrymen at the announcement that the National Poultry Organisation Society has ceased its separate existence by combination with the Agricultural Organisation Society after a career of fifteen years, during which time it has done much for the poultry industry in this country, and exerted a wide spread influence. In a letter issued to the members, signed by the Marchioness of Salisbury, president, after concisely reviewing its history, the reasons for this step are stated as follows:

Until 1909 the society was mainly responsible for the promotion of co-operative societies for collection and sale of eggs and poultry. It had been felt that with proper methods of organisation, and with proper packing and grading success could be attained by co-operative societies, on the model of those working in Denmark, and it was also felt that a certain market for high class eggs and poultry existed in England, and that English produce could successfully compete with foreign goods if the standard was equally good and reliable. Though the number of such societies that we have established was not very great owing to the fact that the system thus advocated was new, the success of these depôts has been most remarkable, and the influence they exerted has led to a vast improvement in methods of and prices paid by ordinary traders, and I am most anxious to draw attention to the great success which was achieved in this direction. The work done in this way by the societies proves conclusively that, worked on co-operative lines and with proper organisation, the poultry industry is one that can be made of the greatest importance to the country.

In the year 1909 owing to the Small Holdings and Allotments Act public money became for the first time available in respect to such work.

It was decided by the Board of Agriculture and Fisheries that grants could be made only to one society dealing with all branches of agriculture. The Agricultural Organisation Society was selected and this policy was continued when the Development Fund was allocated in 1911. As to the policy thus adopted, it is needless to express any opinion, though I may mention that in Denmark and elsewhere each branch has had its special organisation.

As a consequence, in 1909 the work of organising egg and poultry societies was transferred to the Agricultural Organisation Society. A body dependent upon private generosity could not bear this responsibility where national resources were brought into competition.

It is further announced that the A.O.S. has formed an egg and poultry committee. We understand that Lady Salisbury and Col. R. Williams, M.P., are members of it, and that Mr. Edward Brown, F.L.S., who was for fourteen years secretary of the N.P.O.S., is acting in the same capacity, so that it may be expected the policy which has hitherto been adopted will be continued in the future with enlarged scope and opportunities.

The Belgian Poultry Epidemic.

We have felt constrained to devote a considerable amount of space in this and the two previous issues to the serious outbreak of disease in Belgium, by reason of the fact that it concerns the poultry industry in lands where a similar experience has not been met with but where intensive methods of breeding are being adopted. We feel certain readers will agree with us that this question is not one to be ignored. Up to the present time intensive poultry-keeping, certainly that with a commercial end in view, has been to a very large extent experimental, although that fact has not received recognition by many of its advocates. They have forgotten that the evil effects of such methods are often not immediate, but are none the less accumulative and certain, perhaps taking a number of years before they exert their full influence. Recent years, however, have provided several examples in this direction, most noteworthy of which are the devastation in the Turkey areas of the United States, the cause of the enormous mortality due to White Diarrhoea in that country, and now the heavy loss in Belgium. Where the last named is so striking an object lesson is due to the fact that it is at once concentrated and yet general. Isolated cases do not leave the same impression. The valuable reports which we have been able to present on the scientific side by Profs. Frateur and Maldague, and on the practical side by Mr. Edward Brown, F.L.S., should be read together. They form a more or less complete survey, and cannot be regarded independently. It would be well if copies of these could be placed in the hands of all who are adopting intensification.

Fecundity in Fowls.

In the extract which we give this month from Dr. Raymond Pearl's paper dealing with inheritance of fecundity, there are two points to which we desire to call special attention, as these have often been in dispute. First, as to how the increase has arisen. It will be seen that emphasis is given to the effect of removing eggs from the nest upon the actual number produced. In this direction it is shown that when the cycle is disturbed by such removal there is a reduplication of the process. As instances, a wild Mallard has been known to lay five to six times as many eggs due to their removal from the nest, and it is cited that a Wryneck was made to produce 48 eggs, and a House Sparrow 51 by the same method. The second point is with regard to the actual number of oöcytes in the ovary of a hen, upon which the views generally held appear to be entirely erroneous. Recently the claim was made that not more than 600 of these oöcytes, as they are called,

can be found in the ovary of a hen, and that the more she lays in her first and second years the fewer are possible of production later. In practice there would appear to be some justification for this view, although we have known hens to contain more than the number stated. Dr. Pearl, however, shows that such a statement is entirely erroneous. Reference to the table as printed reveals that in one case the ova numbered 3,605, and that the lowest fowl had 914. These two statements and the data upon which they are based will help us to more definite ideas in these direction. What we require is positive information, which in such questions can alone be obtained by patient and careful investigation, upon an adequate scale, such as is here recorded.

Local Monopolies.

The tendency of nearly all trading is in the direction of monopolies. In some cases we find huge combinations controlled by a comparatively small body of men, but with large aggregations of capital. In other instances the area of operation and of trade done are small. Both tend to restriction of natural and regular outlets, and as a rule are antagonistic to the interests of producers. Much could be said as to the influence thus exerted upon poultry keepers in those districts where eggs and chickens have to pass through local markets, and especially where there is a limited consumption in the immediate area. Under such conditions it is generally true that prices are low, and, as a result, quality is inferior, as there is no incentive towards adoption of better systems. The poultry industry does not suffer to any serious extent from large monopolies, save in the market arrangements in our great centres of population. That, however, is another story which deserves fuller consideration. What we have now in view is the need for breaking down these small but none the less powerful local rings. That is one of the objects of the co-operative movement, which has already exerted considerable influence although to a small extent of what might be done. The result is not to be measured by the profits actually made by these societies, but rather by the better prices obtainable due to adoption of improved methods of marketing. We believe that in no instance where a co-operative society has been formed has there failed to accrue great benefits in this way, even where the profits in trading have not proved equal to expectations.

CO₂ in Incubation.

The information given in Prof. Geo. H. Lamson's paper, published elsewhere in this

issue, on the generation of Carbon Dioxide by the Chick Embryo and the effects upon its development, is the result of a long series of carefully thought out experiments and tests, and adds considerably to the knowledge we already possess on the subject. The main conclusion is that an excess of CO₂ in the egg chamber reduces the hatching percentage very perceptibly, but at the same time the range between the amounts of CO₂ in the air, that is unnoticeable in its effect, is very wide. Although it is shown that in these tests the best results were obtained when the air contained fifty to seventy parts of CO₂ in the ten thousand—similar to the amount found under a hen—it was also noted that when from thirty to two hundred parts were present it seemed "to make but a small percentage difference in the hatch, and but little difference in the mortality through brooding."

Nine Months' Imports.

The year 1913 is in many ways remarkable, and not less in respect to foreign supplies of eggs and poultry than in other directions. After a steady, if not large, decline in import figures, there has been a large increase, which has continued throughout the year up to the end of September. The figures published in the trade and navigation returns for nine months of the current year as compared with 1911 and 1912 are as follows:

Year	Quantities		Eggs.	Values	
	Totals Gt. Hds.	+ Increase — Decrease Gt. Hds.	Totals	+ Increase — Decrease	
1911	13,570,455	—	£5,372,973	—	
1912	13,223,604	—346,851	£5,500,416	+£ 127,443	
1913	15,450,051	+1,879,596	£6,459,995	+£1,077,022	
Dead Poultry.					
	cwts.				
1912	151,727	—	£461,559	—	
1913	183,875	+32,148	£600,627	+£139,068	

These advances are very great indeed so far as poultry are concerned. The rise this year is explained by the increased supplies from the United States of America. In eggs, Russia and Denmark are largely responsible. Usually, however, with greater supplies there is a decline in value. Such is not the case. The average declared values of all imported eggs for the three years are respectively: 1911, 7s. 11¼d. per great hundred; 1912, 8s. 3¼d.; 1913, 8s. 4¼d. In spite, therefore, of a greater volume of supplies equal to upwards of fifteen thousand tons from 1911 to 1913, the average value has advanced by 5d. per long hundred, which is an indication of an even greater growth of demand.

American Poultry Association.

From the reports which have come to hand it is evident that the annual meetings of the above association, held at Atlantic City, New Jersey, were a great success. The attendance was greater than ever before, upwards of 5,000 registering themselves as members or guests. The *locale* was specially attractive. During hot weather to hold a meeting a thousand feet from land, with the sea waves lapping below, combined business and pleasant surroundings seldom met with, and which few places could provide. From the published programme it is evident that the practical side of poultry husbandry was given a prominence not accorded to the same extent previously, and there was a large attendance of those engaged in the work of instruction and experiment. This bringing together of the two sections, *i.e.*, fanciers and utility breeders, is to be highly commended. It was announced that the A.P.A. has now exceeded the 5,000 membership mark, upon which it is to be congratulated. Mr. Reese V. Hicks vacated the presidency, after two years of office, and Mr. E. B. Thompson now occupies the presidential chair.

Contagion versus Degeneracy.

In connection with the Belgian epidemic, as is always the case, there is danger lest remedial measures should merely deal with what may be termed local causes. Mr. H. Barnard, writing in *Feathered World*, tells of a means he has used for the prevention of contagion, claiming that if it were applied, as well as, to use his own words, "a complete overhauling of the Belgian methods of housing and caring for their stock." That may be so or not, but if we have read aright Mr. Edward Brown's report, as printed in our September and October issues, he attributes much to the effect of bad methods of breeding, which, with other contributory causes, have so debilitated the stock that they are unable to resist the attacks of microbes such as those responsible for this outbreak. Even were it correct, as suggested by the correspondent of our contemporary, that the chicks can be protected, upon which more evidence is necessary, what is stated in Professor Frateur's report, from which quotations are given on other pages, shows also that the hens are affected. In that case all such protective measures can only be transient. What has yet to be done is to clear the parents, without which any influence exerted will be temporary. The great danger of intensification is degeneracy in the fowls, and until that is solved, sooner or later there will be heavy loss. That there must be intensification is unquestionable. Our business is to discern its limitations.

Egg Trains.

Having adopted the English idea of egg and poultry demonstration trains, in itself an adaptation of the American agricultural trains, the United States Department of Agriculture has gone one better than anything done here, in that it has equipped a poultry and egg refrigeration car, embracing two chilling rooms, wherein testing can be demonstrated as on the North Wales expedition last May. Grading and packing is also shown, and the methods of treating poultry demonstrated. This car has its own gasoline engine for running the refrigerating blowers, and for generating the electric light for use in the car. It is stated that the blower will reduce the cool rooms to 32° F., and cool the eggs to 40° within twenty-four hours in the hottest summer weather, when the loss is greatest. The car has already been in Kentucky, and this season visited every railway centre of importance in Missouri. The example might well be followed by our Board of Agriculture. The two egg trains have been run at the expense of the two promoting societies, and, in the case of North Wales, aided by personal subscriptions. So far as we know the central authorities have not contributed, and only one County Council. It is in every sense a public educational work, as recognised by the U.S. Department of Agriculture.

Poultry on the Small Holding.

In the October issue of the *Journal of the Board of Agriculture* there is an interesting record of the results of poultry keeping on half-an-acre of grass land. A beginning was made in April, 1912, with twenty-six females and two males. Hatching, carried out between 16th April and 26th June, produced 104 chickens. The cockerels were sold at a killing age, and, with some of the older birds, 69 fowls were disposed of altogether. The capital expenditure was £19/16/3, and with a turn-over of £44/1/0 a net profit of £14/1/9 was realised. This profit goes towards the items of rent, interest and depreciation, and to repay the small-holder for his work. The labour only amounted to from one and a half to two and a half hours per day. This demonstrates the value of this industry to occupiers of small areas of land.

The Prime Minister of New Zealand.

Representatives of the New Zealand Poultry Association have been interviewing the Prime Minister of the Colony, submitting to him various points for consideration, among others railway rates, import duties, laying competitions, and feeding tests. From the reports to hand they met with a very favourable reception.

THE EPIDEMIC AMONG CHICKENS IN BELGIUM.

THE REPORT OF PROFESSORS FRATEUR AND MALDAGUE^a,

BY EDWARD BROWN, F.L.S.



As previously announced an important communication has been published upon the researches made at the University of Louvain into the Belgian Poultry epidemic, for a copy of which I am indebted to the courtesy of Prof. Frateur from this I make some extracts of which the following are translations.

"During the last two years," says this report, "an epidemic has made its appearance in the poultry breeding farms, principally those which are engaged in production of *poulets de Bruxelles*; breeders of fowls for laying are not, however, free. This infection is very wide spread. At first discovered in the neighbourhood of Londerzeel, it was afterwards found in the regions of Schriek-Heyst-op-den-Berg, and later it has made its appearance in the breeding places of Flanders, of Limburg, and in the Walloon sections of the country.

"The ravages caused by this infection have reached such an importance that several important establishments have been for the present abandoned, and that has led several investigators to undertake its study.

"Mr. Liénaux, professor of the Veterinary School at Cureghem, in a communication made to the Veterinary Society of Brabant, attributed the disease at Londerzeel to coccidiosis.

"Messrs. Hebrant and Antoine, professors of the same school have studied 'the causes of the large mortality of chickens observed in Belgium in 1913^b'. They attributed it to several different maladies, notably, ovarian infection, pneumonia, intestinal coccidiosis, rickets, roup, and chicken cholera.

"In 1911, one of the writers, M. Frateur, had observed the disease at the Zoological Institute at Louvain upon Concon de Malines hatched from eggs coming from Londerzeel. He stated: 1. that a large number of embryos died between the first testing and the hatching; 2. that the small number of chickens which hatched succumbed, in a high proportion, between the fifth and the twenty-first day, after having presented the following symptoms: prostration, sleepiness, roughened feathers, dropped wings, pronounced emaciation; after some five hours the chickens expired in a pronounced comatose state, in other cases death supervened rapidly.

"On making an autopsy or post mortem examination, he noted the following lesions, bronchial-pneumonia with red or grey inflammation, discoloration of the liver, enlargement

of the gall bladder, and renal or kidney hemorrhage.

"Continuing to observe the same disease upon chickens hatched from eggs bought in from different villages around Malines, and having proved that the same infection raged in a large number of breeding yards, he was thus led to make a more complete study. These researches, commenced personally, were then pursued on demand of the rural office of the Ministry of Agriculture.

"By reason of the transmission of this infection through the eggs, he thought at first of the possibility of an agent belonging to the protozoon class. For elucidation of this question he requested the collaboration of Professor Janssens, director of the



The Zeeland Section at the Hague Exhibition.

A descriptive account of this exhibition was published in our last issue.

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protozoological laboratory of the Institute Carnoy. The researches made in that direction gave a negative result. Examination of the blood has never disclosed the presence of any species. He had proved one isolated case of intestinal coccidiosis, but this was alone in the hundreds of post mortems made. Besides, the germ of the malady which is described later has been found in the chicken.

"At the termination of these negative results, M. Frateur obtained the collaboration of Professor Maldague, director of the experimental pathological institute of Louvain University. We now publish

^a Brussels, M. Weissenbruch, Printer to the King, 37 pp., illustrated.

^b Annales de Médecine Vétérinaire, July, 1913, p. 369.

briefly the principal results obtained up to the present time (August 1st, 1913)."

The researches of these investigators are dealt with in six sections of the report, namely,

- I. Lesions and symptoms of disease in chickens.
- II. The Bacillus.
- III. Origin of the bacillus and disease in adults.
- IV. The disease.
- V. Diagnosis.
- VI. Prevention.

These cannot be given in full, but in the following summary the leading points are stated.

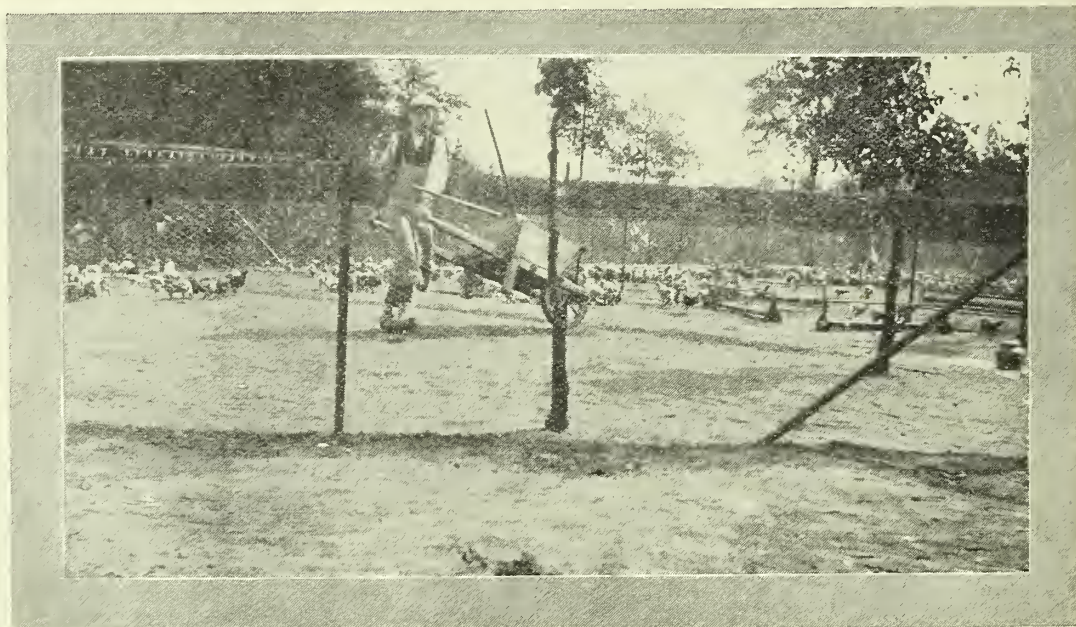
I. It has been found that the birds affected are very emaciated; the breast bone is sharp, soft, and a little ossified. On post mortem examination the liver is discoloured with a uniform yellow, or pale brown stained with yellow. The gall bladder is often much enlarged, and the organs around, and the walls of the abdomen, are also stained with yellow. The blood vessels of the mesentery are more or less charged with blood. The kidneys are to some extent discoloured and show hemorrhage. The spleen is sometimes normal, but often pale and small. The crop is frequently distended by fermented food, and the intestinal contents often normal, and soft with mucous. In that case congestion was observed, and was always intense. The lungs are very much inflamed, with more or less congestion. The pericardium is frequently thick and whitish, enclosing a certain quantity of pale yellow liquid. The ventricular portion of the heart is pale. The cardiac vessels are much charged, and the right ventricle frequently presents at the base a pronounced furrow, more especially in those subjects which succumbed slowly.

The earliest symptoms are that some of the chicks refuse to eat from the first, and are very thin. Later there are two classes of symptoms, acute and chronic, the former of which is fatal in a few hours, and the latter in two to three weeks. Diarrhoea more or less severe is present in both forms. In a few instances chickens which did not present any symptoms of the malady, do not grow, but remain small

and thin, in some cases attaining adulthood, in others dying from heart weakness.

M. M. Frateur and Maldagne state that the mortality during the embryonic stage is very large. In three cases recorded this was 49.5, 72.4, and 52.9 per cent. respectively. In addition the mortality after second day following hatching was 12.7, 27.3, and 42.4 respectively. Interesting tables are given showing on several farms the daily mortality, which, taking both before and after hatching, was disastrous in the extreme.

II. The conclusions arrived at, are that the disease is produced by a microbe apparently of the bacilli class. This organism presents the



On a Belgian Poultry Farm.

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form of a small staff with round extremities. Its size is very variable. Some, however, are short or round; in others the appearance is plainly a bacilli; in other cases they are like long filaments, slightly wavy. The round form are generally met within the coats of the organs; the bacilli in new cultures, and the long in old cultures.

A description is given of the investigations made to fix the character of the germ, but these cannot be given as they would require too much space, nor are they necessary.

"The germ which we proceed to describe, 'says the Report' is certainly the cause of the disease. We have limited ourselves to furnish the two following proofs which are sufficient.

"First: We have bacteriologically examined a very large number of dead chickens which have shown typical symptoms of the disease, or sacrificed others besides these; in all cases, without exception, we have detected the presence of this organism. They were found in a pure state in the greater part

of the tissues, notably in the lungs and the blood. In several subjects, with which the bacteriological examination took place several hours after death, cultures of the spleen had also developed at the side of the typical colonies, one or the other a strange colony.

"Second: (a) On May 18th, 1913, twelve chickens, two days old, coming from a non-infected source, were divided into two equal groups. Six were injected with 2 centimetres cube of soup culture through the cheek. They all succumbed in the space of three to eight hours, presenting the symptoms and the characteristic lesions of the disease. Bacteriological examination revealed in their organs the presence of the inoculated microbe. The second group of chickens served as proof, and were placed under living conditions exactly the same as the first. All have survived.

"(b) On July 17th, 1913, seventeen chickens, aged two days, and from a non-infected source, were divided into three groups, the two first of six each and the third of five individuals. The six chickens of the first group each had injected a half centimetre cube of soup culture through the skin of the upper part of the neck; the chickens of the second group were inoculated with the same culture through the cheek; and the five chickens of the third group served as a test. The birds of all the three groups were placed under conditions exactly the same.

"Of the first group five died in the space of two and a quarter days; the sixth developed the chronic form and died on the seventeenth day after inoculation.

"Of the second group three died in the space of three days; the other three succumbed between the seventh and the twenty-third day.

"All the dead chickens presented the symptoms and the characteristic lesions of the disease, and bacteriological examination demonstrated the constant presence of the inoculated microbe in their organs.

"The five others have all survived."

The writers state that there is no doubt as to the microbe being the same as that causing the mortality at Londerzeel. During the last two years upwards of 7,000 eggs from that district have been hatched at the Institute, and dead chickens have been obtained at Londerzeel and Schrieck. In all these the microbe found was the same. Further, some of the breeders have replaced the chickens by ducks, thinking the latter would be immune. Such, however, has not proved to be the case, and the mortality has reached 80 to 100 per cent. A further communication on this subject is promised.

III. Origin of the bacillus and disease in adults. Observations made showed that the germ of the disease existed in the egg. This was proved by careful tests. The report makes record of a series of these experiments, which,

cannot now be given. Further, it was proved that the bacilli were already in the yolks. This led to pathological observations in connection with adults. In the report are some beautiful plates in colour in which the lesions are clearly seen. Reports of a number of atopsies appear to leave this question without doubt.

The disease in adults is very insidious and cannot be noticed for some time after it has commenced. One of the first symptoms is the delayed laying of hens, and reduction of the number produced. Further, of the eggs laid by infected hens, about 50 per cent. of those fertilised failed to hatch, and even more, in some cases 75 per cent. Tables are given which give in detail the results of various observations. As the report says:

"If we have insisted upon these particular features: diminution of laying, mortality before and after hatching, it is that these constitute the exterior signs the most precocious of a disease with which a poultry yard could be infected.

"At a more advanced stage the birds lose flesh, they are sleepy, retire into isolated places, and bury their heads under their wings. We remarked several times that certain subjects were abnormally developed in the abdomen, which became prominent. As a result, the feathers of the lower body were covered with excrement. There was a little palpitation, whilst hard tumours were more or less voluminous.

"We could then discern a conspicuous feebleness of the limbs; the birds found it difficult to stand upright; the emaciation became extreme, and they died after an agony extending from one to several days."

It is pointed out that the microbe producing this disease was the same in adults and chickens, and it was found in the ovary and oviduct of hens, and in various parts of the body, including the heart, lungs, intestines, and blood, and also in the excrement.

IV. THE DISEASE. The conclusions arrived at are that the disease is both hereditary and acquired. In the former case chickens are hatched with it, coming by the egg from the hen. In the latter it may be by infection as a result of tainted soil, owing to the infected excrement, upon which point some very valuable experiments are recorded, leaving no manner of doubt that this has had a great share in its dissemination. It is also suggested that contagion may arise in other ways, such as by attendants, baskets, wild birds, food troughs, etc.

V. DIAGNOSIS. This aspect of the case is presented under two heads, that is, in chickens and adults.

"The diagnosis of the disease in the chicken, 'says the report,' in the case of an epidemic is easy. The large mortality of chickens, by stages in the two or three weeks which follow hatching,

is a definite indication. The dyspepsia, state of emaciation, refusal of all food, sleepiness, irregular and often alarming diarrhoea, are some of the signs which awaken attention." Other proofs are resultant from *post mortem* examination.

So far as adults are concerned some of the symptoms have already described, and also that chickens from them died in large numbers before or after hatching. Other tests can only be made after death, as shown under No. III.

VI. PREVENTION. "Our researches are not sufficiently advanced, 'say the authors of this report' for us to describe any definite rules for prevention. We think nevertheless that measures may be employed that we now state of a nature to check the epidemic and permit a re-stocking of the breeding yards.

"The first thing to be done is to establish whether the farm is or is not contaminated, as the preventive measures would be different in the two cases. To arrive at this determination, we fix 1st. upon the results of the laying; 2nd. upon the results of hatching; 3rd. upon the mortality of the chickens; 4th. upon the post mortem and bacteriological researches made upon birds dead or ill; 5th. upon the transmission of the infection by the adults."

The measures recommended in non-contaminated poultry yards, are to avoid introduction of eggs, chickens, and fowls from infected areas. This would mean in many cases not buying any at all. The report also points out that the disease may be transmitted in other ways, as already stated, and by wild birds.

So far as places are concerned where it is known that the disease exists, "the best solution would be a recourse to stringent means." This includes employing the means of immediate suppression of the entire stock of chickens. That is a drastic measure but the only safe course. So far as adults are concerned all showing any symptoms of disease should be slaughtered at once, and those apparently unaffected fattened and killed off.

The soil, houses, and appliances should be carefully disinfected. The soil should be turned over to the depth of four inches and treated with a solution of sulphuric acid, repeating the process at two intervals of fifteen days, and keep it clear of stock for a couple of months. Various other bactericides are recommended for the houses and appliances which are well known, but which it is not necessary to

recapitulate. Mention is made of the fact that serum injections have failed to prevent the progress of the disease.

It will be seen, therefore, that what I suggested as contributory causes in my own report are not dealt with, namely, the methods of breeding, rearing, and feeding adopted. These are questions for practical poultry men rather than scientists. My own view is that but for adoption of systems which have weakened the stock in the first place, and offered a favourable environment for bacterial development in the second, this epidemic would not have taken place. That is where the lesson lies. I regret to see a writer states in *Chasse et Pêche* that "the disease is exerting its ravages in the whole of Belgium,



Goucou de Malines on a Belgian Poultry Farm. [Copyright.]

and is menacing seriously the prosperity of industrial aviculture." That it can be restored is unquestionable, but such can only be upon less intensive and more natural lines, so far as actual production is concerned, in which plant cultivation holds its due relationship to the poultry kept.

Prizes for Rotten Eggs.

It is stated that at a recent Midland Agricultural Show, in a class for eggs the first prize was awarded to a lot, which afterwards were proved to be rotten. There is a good deal of the same sort of thing all over the country. The Judges selected often do not understand their work. Prizes appear to be awarded to the size and shells, not the contents.

A POULTRY FARM ON A SMALL SCALE.

By GERALD E. CASE MORRIS.

THE photographs which go to illustrate this article are examples of how a two-acre plot can be laid out to advantage on a small capital of £75.

The scheme generally is to run a hundred birds, pullets and hens for eggs and stock, and to fatten and sell the superfluous cockerels.

Commencing in the autumn the stock consisted of thirty-four laying pullets and four cockerels. Twenty-six of these pullets were light Sussex, six White Wyandottes, and six Salmon Faverolles. Thus there were three pens of Sussex, one pen of Wyandottes, and one pen of Faverolles. By keeping one pen of Sussex pure, and crossing the remaining two Sussex pens and Faverolle pen with their respective cockerels, a splendid first cross for

Thus by the end of June the ducks and cockerels sold had paid for themselves, and also for the keep of 70 young pullets besides the laying hens.

Roughly then, the profit accruing over the nine months' work was the value of the pullets, viz., about 4s. each, as the original price of the eggs and chickens and ducks had been covered by a small cash balance in hand.

This is briefly the outline of the scheme followed; the fattening birds all gone, there remained only the original stock birds and some 75 pullets, which would soon be laying well. The bought eggs were incubated, and stock eggs hatched by broody hens.

By rearing all the chickens together a certain economy of feeding and labour was effected, and the hens themselves could be turned back to their



White Wyandotte hens and pullets on the small farm described on this and the following pages.

[Copyright]

table birds was obtained. Naturally it was impossible to increase the stock to 100 laying birds during the first year without buying eggs or chicks, so £5 was laid out in January in purchasing these, and the eggs from the stock birds sold to pay for their keep.

In February 50 cross-bred Aylesbury and Pekin duckings were purchased and fattened for market. These proved a tremendous success and realized from 3/6 to 4/- when 8 to 10 weeks old.

The superfluous cockerels which were raised from about 200 eggs bought, amounted to about 60, and some were sold to the fatteners at 2/6 to 3/6 at 12 weeks old, and the remainder sold privately.

respective pens and brought on to lay quickly—a much better method than allowing them to run with their own chickens.

This facilitates rearing chickens to maturity and is most economical because they are far more independent and grow faster.

The brooders themselves were heated by ordinary hurricane lamps and had two compartments, the smaller one being the actual brooding chamber and the larger one the day compartment or scratching shed. Both compartments of all houses were well supplied with peat moss, and kept clean always.

Most beginners scarcely seem to realize the fact

that chickens will not thrive and grow unless they have fresh air and exercise from the time they are seven days old, and in their anxiety to keep their chickens warm they completely close up the brooder, only allowing the chicks out on fine days in the open. A greater mistake was never made, for it will very soon be found that unless they have open air exercise after they are a week old, they will die from leg weakness and want of stamina caused by lack of oxygen. A large open scratching shed next to the brooder well covered with any sort of dry material is the best possible method, in wet or cold weather, but failing this they must run out on the grass.

As to the poultry houses themselves. Naturally those, combined with scratching sheds, are the best to use, but as they are expensive and cumbersome to move, it is only possible to have them in the permanent pens—for the breeding

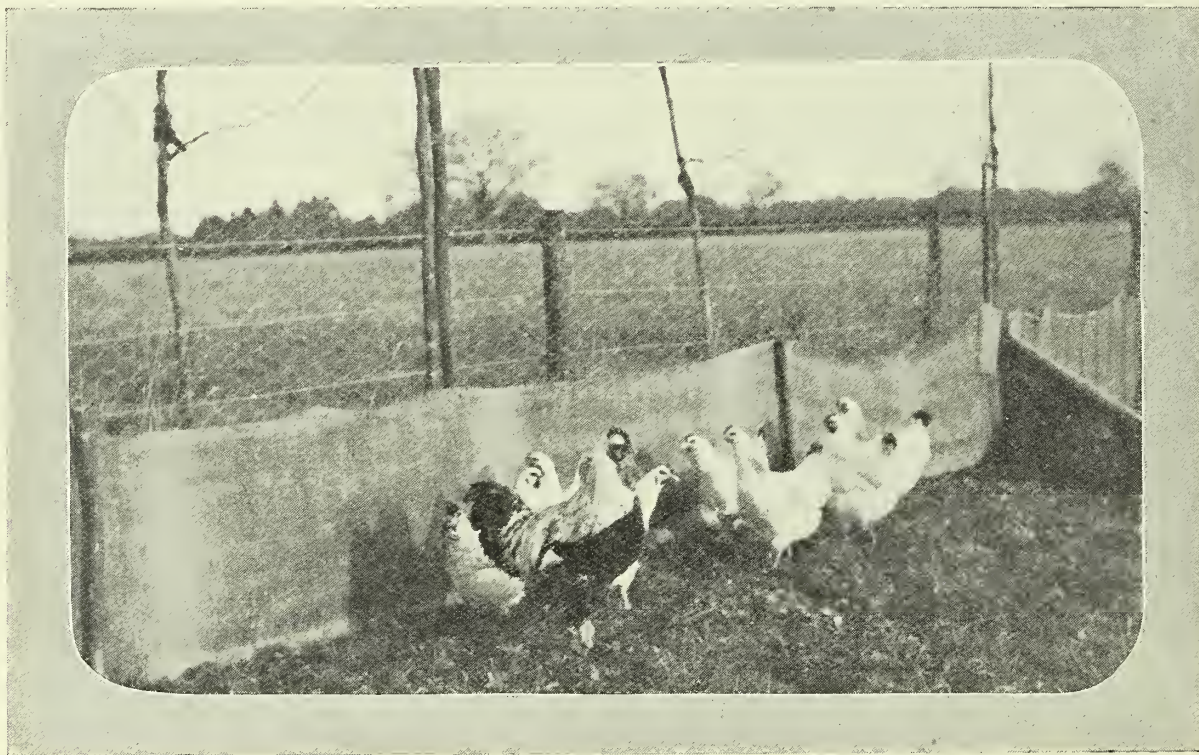
February, and sold at sixteen weeks old. The price for the bird averages from $3/6$ to $4/9$ according to size and weight. This is naturally a fair profit to make if a large number are sold. At times it pays to sell earlier (when only half ready) to the fatter for cramming, at $2/6$ to $3/6$, thereby clearing the ground and saving the food bill.

There is a big demand for plump birds all through the spring and early summer, so early hatching is essential.

A first cross is preferable, chiefly because they make larger framed birds, and also, because they are undoubtedly hardier and grow more rapidly in the short time available.

Food is a great factor, one must buy the best, yet economically. For chickens intended for fattening, there is nothing like Sussex Oats and skim milk, thoroughly mixed, dry and crumbly.

Occasionally a change of boiled wheat, mixed



Pen of Light Sussex mated to a Faverolles cock.

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stock, which number fewer to a house than the ordinary laying stock.

The birds are fed in the scratching sheds in wet weather, and not let out too early, thereby always ensuring their feet being dry until the morning mash has been digested. This means more eggs of greater fertility, a strong point from January to April. By the end of June the entire stock should be reduced to the laying birds only—hens and pullets—for the simple reason that the price of fat chickens drop considerably after June owing to the influx of the foreign ones, so that it does not pay to raise quantities of fat cockerels after this time.

It is roughly estimated that a good fat bird costs $2/6$ to produce if it is hatched in January or

with the ground oats, forms a splendid meal. Soft swollen food is easier for them to digest. By treating the wheat in this way you will find that it goes much farther—while its fattening attributes are intensified.

Everybody has their own method of feeding, but, the essential point is little and often. Laying hens thrive on any kind of food that does not produce too much fat, and three handfuls distributed among a pen of six birds at a meal is sufficient. It is so easy a matter to over-feed a laying hen in confinement. This fact is very often overlooked.

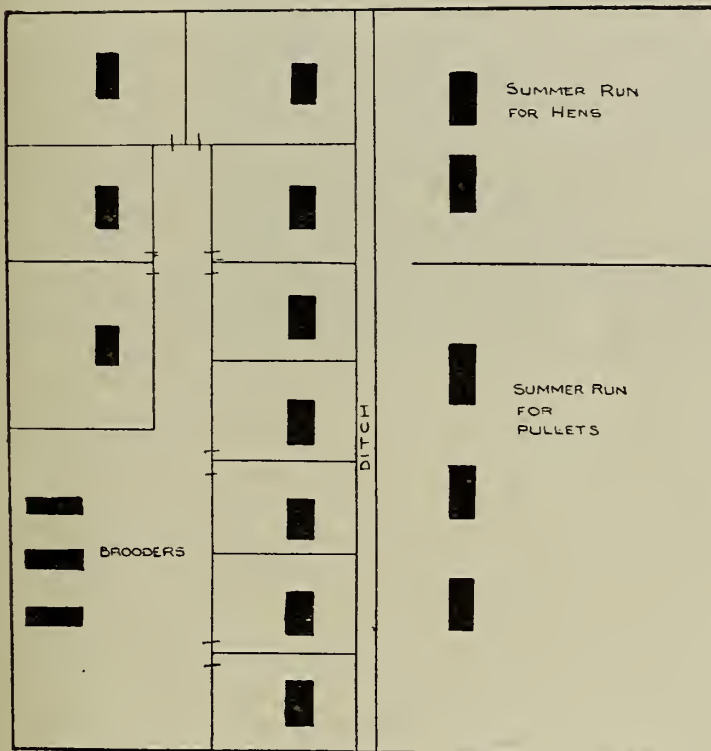
On this small plant the major portion of the wire used for fencing was only four feet high. This really is sufficient and saves posts which necessarily are a serious item, even on a small area.

The posts used were merely six or seven foot fruit stakes, which can be bought almost anywhere for 5/- a hundred.

The netting itself was just fastened by long wire nails to the posts. These nails were bent upwards and not hammered in full length. This allows for removal of the netting any time, which is not an easy matter if staples are used.

The posts were placed about two yards apart and driven a foot into the ground. All the gates were made from these posts or stakes, having the post on one side longer than the other, so that the point rested in the ground and formed a hinge on which the gate swung—a sound and cheap method in practice. It is, however, necessary to drive a small block of wood into the ground for the point of the post to rest on, and thereby prevent it sinking.

Tarred matting was used for sheltering the pens, which is far cheaper than wood, and if securely



Plan of the small poultry farm. [Copyright

nailed by thin battens, or laths, to each post, will not get blown down however strong the gale.

It will be seen from the photographs that the acre of field upon which the laying stock are placed is divided into two portions. The pullets inhabit the larger portion, and the hens the smaller. This is in the summer time when the pens in the adjoining acre are empty.

These methods may not coincide with other views of poultry farming, but they might certainly be useful to beginners and those with small capital whose desire is to use all available space to the very best advantage—yet avoid at the same time overcrowding.

THE DEALER.

By Miss S. CAREY.

TRAVELLING home from America it chanced one day that a copy of the ILLUSTRATED POULTRY RECORD attracted my attention, and picking it up, an article headed "The Dealer," clearly written by a breeder with profound disrespect for the man who sold birds he had not bred, caused me to sit down a space and consider why the contempt for this business should have arisen.

If the writer chances to see this article, perhaps he will explain why in probably 90 per cent. of the businesses of the world the manufacturer does not retail his goods to the public but passes them out through the hands of the retailer, and it is considered perfectly reasonable that he sells at prices often double and treble the price he has paid—and if the breeder of live stock chooses to sell to a retailer, and the latter places a figure on sufficient to cover the wide expenses he is put to in advertising, the risks he takes in finding a market, loss of stock purchased, or deterioration whilst on his hands yet still leave himself a working profit, he becomes dubbed by the Fancy "a dealer," and is spoken of in terms that cast a slur.

Take a chemist, for example, and compare the prices at which he sells his drugs with the prices he pays for them, or a china shop, where, I believe, profits are even greater—yet one does not speak of these two business men as "dealers" in tones that would convey their actions were not honourable.

Then again, let us glance back to the poultry world and see why the retailing business should not be equally honourable as that of the breeder or "manufacturer" of the birds. In many instances the breeder is either a wealthy man who breeds for a hobby, or a working man who is away at toil all day, and in neither case does he care to fill his few spare hours with correspondence; to retail his own birds means he must advertise either by attending shows regularly or the usual displays in the papers, both methods are equally uncertain in their results, some reaping rich profits, others only showing loss, since some two-thirds probably of the Fancy can be placed in either one or other class it seems reasonable to expect that such a class of retailers should spring up who were prepared to take on their shoulders all the risks, trouble, and expenses of creating and finding new markets, and if they have charged an increase over and above purchase price, that is perfectly justifiable considering all the expenses involved.

Let us glance for a moment at retailers' expenses. First of all, to command a market that will yield an income to keep a wife and family, and lay by even a small sum for old age, he must rely largely on a foreign market. His advertising, if he intends to hold big orders, will then, instead of being confined to one or two English papers at a few shillings a week, have to go out to perhaps four

different continents, and appear in at least three to six papers to cover the enormous area, and in many American papers the rates are 12/- to 14/- an inch, whilst in these class of papers and in competition with the big advertising schemes to be faced abroad, four to eight inches will be scarcely sufficient, ten to fourteen inches being necessary to give scope for a really attractive display. He will have to employ agents and often pay them heavy commissions.

Then to procure his birds he has to travel, since so few breeders will respond literally to a letter and send just what is requested—two recent examples will explain what I mean. In June I wrote two well-known breeders (whose birds are frequently in the winning pens) to send some January birds which were well forward. I asked for these by return, describing in detail exactly what I required. In both cases some 1912 stock was sent me in various stages of moult, one lot having had the tail feathers drawn, presumably to make believe they were young birds. On another occasion a glowing account was sent of some Campines which arrived in hampers coated with filth and so sick with roup that it was a question whether they would live to reach their home again. As a result I cannot place much trust in a breeder whatever his reputation in the show pen may be, and therefore a retailer under these circumstances has to visit the yards to procure his stock personally—a needless expense if breeders would trade in a more business-like method. The retailer exports at his own risk, and insurance rates are too high to make it profitable to safeguard himself, he therefore has to stand all losses, after purchasing his stock, whether the distance the birds are sent is to India, Australia, China, America, or South Africa, whether they have to go through climates 20° below zero or 115° in the shade—he bears all loss, and is at the mercy of the steamship companies' stewards and train officials, many of whom are totally ignorant of the management of live stock. Further, he has great expense in coops for export, many a coop costing the price of a small chicken house, he has all inland rail to pay on birds to his store and again to the port, besides all the running expenses of his farm and staff, which has to be competent, since much of his time is spent away buying.

Success in the retail business depends largely on his ability as a buyer, and the man who can see the possibilities in a bird if well fed and allowed to grow to maturity under better conditions than those where he is found, or whose trade is large enough to enable him to buy in large quantities at wholesale prices, and among which he can see a few good birds to make a better profit is the only one who can make a living.

To breed winners, is, I admit, the highest art, yet is it not an art to be able to go down into a flock of raw youngsters and pick out the birds that can by care and management be developed into winners. Although the breeder and retailer are quite different

in their objects it takes as competent a judge to purchase winners as to breed a winner, and quite as clever and practical a business man or woman although the line of business is on a different basis.

In some businesses no doubt much roguery is practised, and the retailing side of the poultry supply has suffered acutely from the hands of dishonest men who bought up cheap and even cross-bred birds from cottage runs and sold them out as birds bred from their own exhibition stock.

Because, however, there are a few dishonest folk in a business is that any reason to throw mud at a whole fraternity?

But for the dealer I doubt if the Fancy to-day would exist, hundreds of the smaller breeders are compelled to make their hobbies pay expenses and have not time to find a market for themselves that pays, and unless they do a lot of winning or are able to advertise extensively and judiciously, so that returns would justify their outlay, many would quickly drift out of the poultry world. The retailer by ceaseless efforts, often costly, creates the markets for them, and enables them to have a profitable hobby without risk or trouble in sales. The business can be carried out on absolutely honourable lines, and often with far better satisfaction from the customers abroad, since the exporting of poultry is not an easy matter. The many different countries to which our birds are despatched, and the regulations and customs ever varying standards of judging make this side of the business a tax on the small breeder, where the dealer makes it his duty to know fully just how to proceed in export matters.

Viewed rightly, a great deal more might be made of the retail side of the Fancy than has been up to the present, but it must be worked on a strictly straightforward and confidential business-like basis, securing for each man what he desires, and aiming to give entire satisfaction with every transaction. Where an exporter time after time secures leading honours in the show ring with his purchases, again no one has any right to cast a slur, for it needs every bit as clever judgement to select the winner, which is his business, as to breed a winner, which is outside his domain. Both these branches of poultry farming, although so closely allied, have their own standpoint, and but for the fact that the Fancy has fastened on the word "dealer" a derogatory meaning, due, no doubt, to a few unworthies, this branch of the business would be taken up more readily by those thoroughly competent to run a large and successful trade on sound business lines which could only tend to strengthen the Fancy and be a benefit to all concerned.

A Superintendant of Co-operation.

The New York State Legislature recently passed an Act creating a bureau of supervision of Co-operative associations, and a superintendant has been appointed with office in the Agricultural Hall, Albany, N.Y.

FANCIERS AND FANCY MATTERS.

BY WILLIAM W. BROOMHEAD.

MISS CAREY'S POULTRY.

I had the pleasure last month of paying a visit to Miss Carey of Spilsby, Lincolnshire, and I was delighted at the quality of the poultry which she keeps in the meadows around Toynton Rectory. Several breeds find "board and lodgings" there.

THE MAKING OF NEW BREEDS.

I was very glad to see the article "On the making of New Breeds" by Mr. J. Stephen Hicks, in last month's issue of THE ILLUSTRATED POULTRY RECORD. Fanciers who are anxious to make a name in poultry circles as the originator of some



A pen of Light Sussex on the small poultry farm,
A description of which appears on pages 57, 58 and 59.

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Not only does Miss Carey go in for exhibition birds, but she has some excellent utility stock, among it, White Leghorns from one of the champion egg strains in this country. The White Orpington is perhaps first favourite of the exhibition kinds, and some remarkably promising youngsters have been bred and reared at Toynton this year, the birds combining the ideal characteristics of the breed with beautiful colour, few indeed being in the least "sappy." The Buffs, too, are a fine collection, and the vast majority of them possess that beautiful medium shade of colour so much sought after by fanciers in America. Of new varieties Miss Carey has been busy with one for the past few years, and the result this season is a most satisfactory one. This is the Buff Faverolles, of which she has a hundred or two. Most of them are well up to standard requirements as regards general characteristics, and a few excel particularly in the much desired muffling, while the colour is most promising. Miss Carey does a remarkably good trade at home and abroad, and since she does it all "off her own bat" her establishment at Spilsby is a fine example of woman's work with poultry.

kind or other of fowl would do well seriously to consider Mr. Hicks' advice on the subject, since it is sound from beginning to end. It has to be admitted by those of us who are keen on the fancy aspect of poultry culture that there is very little, if indeed any, scope in these days for the production of an entirely new breed in the fancy. Within the past few years the idea has been practically done to death, and to such an extent have so-called new breeds been brought out that confusion exists, even among old hands. Those who know me as a judge of poultry are aware that I am keen on type—type makes the breed. It is, in fact the one point that should absolutely be studied; and yet, how seldom one finds a so-called new breed differing in general characteristics from an existing one. Take the Rhode Island White, for instance. We already have the single combed kind in the White Plymouth Rock and the rosecombed in the White Wyandotte. Then there is the Red Wyandotte; but wherein does it differ from the rosecombed Rhode Island Red? These are admittedly varieties rather than breeds, although in general characteristics there is no difference. Instead of wasting one's energies and money in the

endeavour to make a new breed it would be much better to strive to get type up to standard requirements.

TYPE.

As I have said, type makes the breed. To-day, however, judges and other authorities are sadly at variance in some breeds, in fact most breeds when

to name only three. All varieties of one breed should conform to the general characteristics of that breed, and unless they do so they should be heavily penalised when they are exhibited for prizes.

ORPINGTONS IN AMERICA.

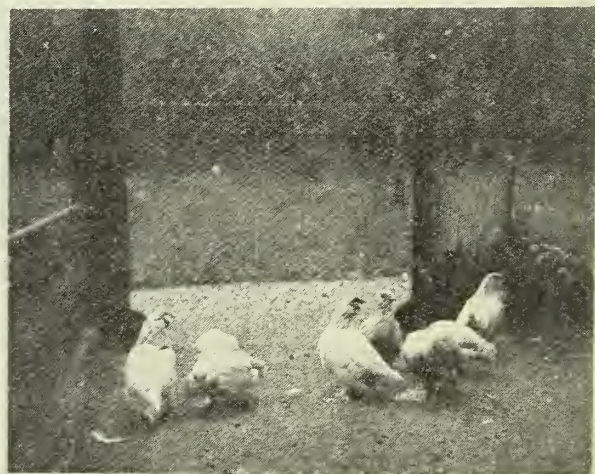
The Orpington is becoming a very popular breed among fanciers in the United States of America, and "the powers that be" across the Atlantic mean to look after its interests. In 1915, the American Poultry Association—an institution that holds a similar position in the American Fancy to the Poultry Club in this country, although a truly "live" one compared with ours—will publish a revised edition of its standard of perfection. It is customary, I believe, for the association to issue a revise of its standard every five years. And for the purpose of keeping in touch with the progress of exhibition fowls a permanent Standard Revision Committee of the American Poultry Association meets periodically to discuss the latest development and to suggest alterations in the text that the advance of the Fancy appears to demand. At these meetings a number of breeders appear, and an effort is made to meet the wishes of breeders, judges and specialist clubs who have changes to suggest. In connection with the Orpington, I see that the male bird's shanks are to be "rather short" instead of "short." On the face of it this may appear to be a distinction without a difference. Nevertheless in my opinion it is an important change, and, let me add, a most desirable one, too. There can be no doubt that among English exhibitors the craze for low setting has gone too far, and with some of them it would appear that the endeavour is to breed Dumpies or Crawlers rather than stately Orpingtons. On such a massive fowl there is no



A Breeding Pen of the famous d'Uccle Bantams.

[Copyright.]

it comes to considering them as exhibition fowls. Too often is this great essential overlooked for some point of colour or marking. Take the Wyandotte for example. Few of the laced or pencilled varieties are fit to rank under their family name for shape; some, in fact, almost resemble modern Langshans in that respect. Then regarding the Orpington. Many fanciers appear to consider that the Black has now attained full scale for shape according to the standard of excellence. Nevertheless, it is not so. There are those, judges as well as exhibitors, who will scarcely look at a Black Orpington hen in the show pen unless the bird has a full and round cushion—"ball" cushion as it is termed—and the furnishing of her thighs very profuse and almost silky to the touch. Such, however, is quite opposed to the standard for the Orpington, although most desirable in a Cochin. But let that pass. Presuming it to be ideal, is it the type seen in the other varieties of the breed? Admittedly, the Blue most nearly approaches it, and simply because the best Blues are bred from the champion Blacks. However, few, if any, Whites are so shown, or indeed bred, and the same applies to the Buff, while when one considers the minor varieties, such as the Jubilee, the Spangled, the Red, and the Partridge, there is a greater variation still. And the same applies to other breeds; Plymouth Rocks, Hamburgs, and Leghorns,



White Barbus d'Uccle Bantams. [Copyright.]

beauty in the extra short legs. Moreover, a male bird possessing such shanks is practically useless in the breeding pen, it being next to impossible for

him to so mate with his hens that their eggs will be fertile. An Orpington male bird, be he cock or cockerel, with shanks rather short instead of short gains all round—his carriage is more graceful, while his breeding powers are vastly superior, and for utility purposes he is certainly the better. Let English fanciers, therefore take the hint. Of late there has been a desire in certain quarters over here to breed Orpingtons with increased length of back; an increased length of leg could well go with it.

"OVER THE WATER."

Many years ago it was usual to complain of the way things in general were done in England, and a common saying was, "They manage it better over the water"—across the English Channel, in France. To-day, folks assert, the saying can truly be applied to the poultry fancy, "over the water" in this instance, however, referring to across the Atlantic, in America. It goes against the grain with an Englishman to acknowledge that he is beaten. It has to be admitted, nevertheless, that where the governing body of the Fancy is concerned we are somewhat in the shade. At least, this much one must conclude from reports of the thirty-eighth annual meeting of the American Poultry Association, which was held at Atlantic City, New York, some time back. At the opening of the session—it is not a three-hour Dairy Show meeting with them—about 200 members were present, but before the close of the convention some 450 names had been registered. The business transacted was great, and the discussions numerous—and at times heated. The suggestion to rob the Rhode Island Red of its family name—it is one of those topsyturvey named breeds, you know—and to cut it down to the plain Red, created probably the most lively discussion during the whole sitting. Indeed, it is said that so "hot" was the controversy that the committee decided to report in favour of taking no action in the matter, and that until May 1st, 1914, the election commissioners receive and record votes of breeders of Rhode Island Reds as to their views of changing the name. Another suggestion, which, however, was scrapped, was to allow exhibitors to have the right, on lodging a fee, to make a written protest against "incompetency or fraudulent practice on the part of any judge," the case to be tried on the lines we adopt with regard to faked birds. A third suggestion, over which it was anticipated there would be real "hammer and tongs" discussion, was that no one connected with a poultry paper "be permitted to solicit advertising at any show held under A.P.A. rules at which he or she may judge;" but it was regarded as a great joke, one speaker remarking that "some one had been handed a lemon." The amendment referring to bleaching, which was expected to cause some lively talk, fell somewhat flat, and it was decided that it is up to the protesting exhibitor and not the judge to prove that birds have been bleached. The question of compelling judges to handle every bird in the show raised the dust, but it was

defeated, since "it was clearly shown that such a vote was unwise"—with which I, as a judge, am in full accord. The word "symmetry" was, after a lengthy discussion, dropped from the score card, in fact, to quote one reporter, it "got the axe." These are only a few of the topics that were discussed at the convention, but it must have been a grand gathering and a change from our lightning work at the Poultry Club meeting at the Dairy.

MORE NOVELTIES.

I hear of a frizzled, crested, bearded and booted breed in the making in one of the London suburbs, while from Gloucestershire are rumours of two more novelties—one the Blanchette and the other the Dervish—and from Cheshire I hear of a fourth, the Audlem. These be pretty names, forsooth, but it is said that all will be ready to be boomed next spring. In the meantime I commend a thorough perusal of Mr. J. Stephen Hicks's article, aforesaid, by the would-be inventors. What with Buttercups, —Flower Birds of Sicily, as the poets know the breed, and *Patera Opulentiae* to the Sicilian peasant—and Daisies the market is getting a bit flooded.

THE POULTRY CLUB.

One might almost say of this, in the words of a somewhat popular picture, "Nothin' doin'." Reports of the monthly meeting of the council are published with religious regularity, but so far as information for members outside the ring, they are about useless. One would think that some steps would be taken by those who run the show to let members know something of the work that is being done. Presumably some business is transacted each month, and I hope that the council is not called together merely to look at each other and then adjourn down below for tea. In the old days there were some fine grandmotherly gatherings in connection with the Poultry Club, but I thought such days were "put be'ind me long ago and far away." However, when the meetings are open to recognised pressmen—and I hear the day is not far distant—maybe there will be something to create a greater interest among members. The branch committees do not appear to be as keen on their meetings as formerly, and the county to which I belong has not had a "chin-wag" for quite a long time—long enough, in fact, to get it called to book if the council were awake!

Last month's meeting of the council, by the way, proved something of a fiasco—it could not muster a quorum and had to be adjourned to the Dairy Show!

THE DAIRY SHOW.

Although the great Dairy Show at Islington is now an event of the past, a few particulars concerning it will not be inapposite. The dates this year were October 21st, 22nd, 23rd, and 24th, a fortnight later in the season than it has been held for many years past. Some fanciers have made enquires as to the reason for selecting such a date, and I think it is not giving away any secret to

mention that it was "Hobson's choice" with the British Dairy Farmers' Association this year. At least I have it on the very best authority that the B. D. F. A's lease of the Agricultural Hall for what is popularly known as "Dairy Show week" terminated last season and through some misunderstanding was not renewed in time for the usual dates to be available—some other show society had booked them. It happens, therefore, that Manchester Show—an important fixture for northern fanciers—preceded the Islington event this year by just over a week, instead of following it as heretofore. This change of date, nevertheless, has not led to a reduction of entries, rather the reverse as a matter of fact. At any rate my opinion is that putting the show back has been greatly appreciated by poultry fanciers, and is the chief reason for such a splendid result.

The aggregate entry received for the poultry section, apart from being by far the greatest within recent years, was a striking proof of the Dairy Show's popularity with fanciers. The total number of poultry exhibits for last month's event was 3,873—almost 550 better than that for 1912, and easily surpassing the entry of 1906. To show how the present compares with previous figures I append the totals since 1905. In that year the entry numbered 3,068; in 1906, 3,347; in 1907, 3,081; in 1908, 3,280; in 1909, 2,997; in 1910, 3,259; in 1911, 3,300; in 1912, 3,330; and in 1913, 3,873. This was, indeed a remarkable total and one that averaged well for the different breeds. The new classes this year—those for which provision was not made in the 1912 schedule—gave a fairly satisfactory return, viz., rosecombed Black Leghorns 26, Brown Sussex 25, Malines 23, and La Bresse 9. The last named was certainly very poor and makes one wonder what the Bresse Club is doing. The greatest increase was made in the classes for Rhode Island Reds, and so very popular is this breed that the entries jumped from 87 last year to 154. Nevertheless, Orpingtons were up by 59, Plymouth Rocks by 47, Leghorns by 31, Minorcas by 27, Sussex—Light, Red, and Speckled—and Old English Game by 16 each, turkeys by 17, and variety bantams by 50.

THE INTERNATIONAL SHOW.

The Grand International Show—the twelfth of the series—is to be held at the Crystal Palace, exactly four weeks after the Dairy, viz., on November 18th, 19th, and 20th. No less than 634 classes have been provided for poultry and appliances, and the list includes the annual exhibitions of thirty-six specialist clubs, in addition to an American section, a Belgian section, and classes for the Young Fancier's League. In the foremost section the only classes provided are for Barred Plymouth Rocks, and competition is confined to American exhibitors. The Belgian section is again a most extensive one and comprises thirty-four classes for bantams, viz., eighteen for d'Anvers, ten for d'Uccle, and two each for du Grubbe, d'Everberg, and

exhibition pens—a male and six females of d'Anvers and d'Uccle. This continental section has always proved a great attraction at the Palace; and rightly so, since Belgian fanciers are expert breeders of bantams and have produced many very charming varieties, none more so than the Millefleurs and the Porcelaine, while the Fauve Herminés is also a beautiful species. I hope, therefore, to see a big entry of "barbus" this month.

The inclusion of classes for the Young Fanciers' League—certainly only two, one being for any variety of large fowl and the other for any variety of bantam—has been questioned in some quarters. The provision of novice classes has always been a debatable point at such an important fixture as the Palace, which is, of course, the greatest poultry show in the World. I see in glancing through the list that several have been omitted this year, and even from some of the club show sections; but those catering for novices are the Dorking, the Black Orpington, the Buff Orpington, the Variety Orpington (Whites only), the United Wyandottes, the Barred and the Buff Plymouth Rocks, the Minorca, the Rosecomb Minorca, the Ancona, the Campine, the Indian Game, the Rosecomb Bantam, and the Table Poultry Clubs. Certainly, the beginner wants encouraging, but in my opinion it could well be done at the small shows, since one goes to the Palace to see the best. And such prizes as are offered in the Young Fanciers' League classes, viz., 10s. first, 5s. second, 3s. third, and 2s. fourth, for an entry fee of 2s., are hardly in line with those given in the novice classes, which are 20s., 10s., 7s. 6d., and 5s. respectively for a 4s. entry fee. The schedule for 1913 is the largest that has ever been issued by the Grand International. Almost every known variety is catered for, among them being such as Lakenfelder, Redcaps, Rhode Island Whites, Scots Dumpies (or Bakies), Polands, Frizzles, and Sicilian Buttercups; and what with two "Any Other Variety" classes there is room for all.

Poultry in New South Wales.

Mr. J. Hadlington, the newly appointed poultry expert, has (says the *Sydney Morning Herald*), taken up his duties with the Department of Agriculture, but it will be some time before his services will be available to the ordinary poultry farmer. Mr. Hadlington will visit the Government farms, inspect the poultry sections, and endeavour to arrange for the adoption of systematic and uniform methods. The Yanco settlers have been promised an early visit, as they are anxious to get some advice and instruction prior to extending their operations. It will thus be seen that a great deal of the new expert's time will be taken up in travelling from place to place, leaving very little time for office duties or writing articles for the "Gazette." It is understood that Mr. G. Bradshaw, who is on his way back from England, will again take up the work he has been doing for over 20 years, leaving Mr. Hadlington free for the outdoor work in the country districts. Mr. D. S. Thompson, the other poultry expert, will probably remain at the Hawkesbury College supervising the valuable experiments he has inaugurated there, and instructing the students in this important branch of agriculture.



The 1st Prize White Orpington Cockerel at the New York Show.

£200 was twice offered for this bird and refused. Bred by and the property of Maurice F. Delano of Vineyard Haven, Mass., U.S.A.

DR. RAYMOND PEARL'S INVESTIGATIONS INTO THE FECUNDITY OF FOWLS.

[Supplemental to the valuable contribution by Dr. Raymond Pearl, the talented Biologist of the Maine Agricultural Experiment Station, which we published in our August issue, we make some quotations below from that gentleman's paper (No. 205) on "The Mode of Inheritance of Fecundity in the Domestic Fowl," as given in the Annual Report of the above Station, which contains records of great moment to all breeders concerned in egg production. We can only now make extracts from the early section of this paper, reserving the conclusions to another issue. EDITOR, I.P.R.]

INTRODUCTION.



DURING the course of an investigation into the inheritance of fecundity in the domestic fowl, which has now involved thirteen generations and several thousand individuals, and has occupied the major portion of the writer's time during the past five years, two definite and clear-cut results have come to light. These are:—

First: that the record of egg production or fecundity of a hen is not of itself a criterion of any value whatsoever from which to predict the probable egg production of her female progeny. An analysis of the records of production of large numbers of birds shows beyond any possibility of doubt that, in general, there is no correlation between the egg production of individuals and either their ancestors or their progeny.

Second: that, notwithstanding the fact just mentioned, fecundity is, in some manner or other, inherited in the domestic fowl. This must clearly be so, to mention but a single reason, because it has been possible to isolate and propagate from a mixed flock 'pedigree lines' or strains of birds which breed true, generation after generation, to definite degrees of fecundity. Some of these lines breed true to a high condition or degree of the character fecundity; others to a low state or degree of this character.

Definite as these results are they give no clue as to how fecundity is inherited; what the mechanism is. Plate has recently said: "Das Ziel der Erblchkeits forschung muss die Aufstellung von 'Erbformeln' für alle untersuchten Merkmale sein." This expresses the case precisely. To determine the 'Erbformeln' of fowls with respect to fecundity has been the goal towards which every part of the present investigation has been directed and urged. It is believed that a first approximation to the solution of the problem has now been reached. While there remain obscure points still to be cleared up, yet the results now in hand appear to indicate pretty clearly the general character of the mechanism of the inheritance of fecundity, and to show what lines further investigation of the problem may most profitably take. It is the purpose of this paper to present an account of the results mentioned. In doing this it will be necessary to bring forward evidence of several distinct sorts, anatomical and physiological as well as genetic. Only by approaching this problem of the inheritance of fecundity from all angles has it been possible to

gain that understanding of the character itself which, in this instance certainly, is absolutely essential to a correct interpretation of any results respecting its inheritance.

BIOLOGICAL ANALYSIS OF THE CHARACTER FECUNDITY.

At the outstart it will be well to understand clearly what is meant by the term fecundity as here used. In a former paper the terms 'fecundity' and 'fertility' were defined as follows, and have been used as there defined throughout the course of the investigation:—

We would suggest that the term 'fecundity' be used only to designate the innate potential reproductive capacity of the individual organism, as denoted by its ability to form and separate from the body mature germ cells. Fecundity in the female will depend upon the production of ova and in the male upon the production of spermatozoa. In mammals it will obviously be very difficult, if not impossible, to get reliable quantitative data regarding pure fecundity. On the other hand we would suggest that the term 'fertility' be used to designate the total actual reproductive capacity of pairs of organisms, male and female, as expressed by their ability when mated together to produce (i.e., bring to birth) individual offspring. Fertility, according to this view, depends upon and includes fecundity, but also a great number of other factors in addition. Clearly it is fertility rather than fecundity which is measured in statistics of birth of mammals.

Taking fecundity as above defined it is obviously a character depending upon the interaction of several factors. In the first place the number of ova separated from the body by a hen must depend, in part at least, upon an anatomical basis, namely, the number of ova present in the ovary and available for discharge. Further there must be involved a series of physiological factors. The mere presence of an anatomically normal reproductive system, including a normal ova with a full complement of ova, and a normal oviduct, is not enough to insure that a hen shall lay eggs, that is, exhibit actual as well as potential fecundity. While comparatively very rare, cases do occur in which a bird possesses a perfect ovary and perfect oviduct and is in all other respects entirely normal and healthy, yet never lays even a single egg in her life time. Such cases as these prove (a) that what we may call the anatomical factor is not alone sufficient to insure

that potential fecundity shall become actual, and (b) that the anatomical and physiological factors are distinct, in the sense that the normal existence of one in an individual does not necessarily imply the co-existence of the other in the same individual.

A case of this kind is found in hen No. 8051 hatched March 29th, 1909, and killed for autopsy record August 24th, 1911. This bird had the secondary sexual characters of the female perfectly developed, and was entirely normal in other respects (body weight, 2366 grams). This bird never laid an egg during its life. The ovary was normal and was of about the size proper to a fully developed pullet just reaching the point of beginning to deposit yolk rapidly in certain oöcytes in preparation for laying. While counts were not made this ovary appeared to carry a normal number of oöcytes. In general it was anatomically normal, but physiologically in the state of development appropriate to a five or six months old pullet just about to lay. The same was true of the oviduct. In this case the physiological factor or factors necessary to the bringing about of ovulation were simply totally lacking, in an otherwise perfectly normal bird.

Some other cases demonstrating the same thing might be cited from our records, but this will suffice for present purposes.

Turning now to the physiological factors involved in fecundity it would appear that there are at least two such factors or groups of factors. The first of these may be designated as the 'normal ovulation' factor. By this is meant the complex of physiological conditions which taken together determine the laying of about such a number of eggs as represents the normal reproductive activity of the wild *Gallus bankiva*. Under conditions of domestication the activity of this normal ovulation factor will mean the production of more eggs than under wild conditions. Continued egg production involves certain definite and rather severe metabolic demands, which under wild conditions will not always, or even often be met. Further, as has been especially emphasized by Herrick, egg laying in wild birds is simply one phase of a cyclical process. If the cycle is not disturbed in any way the egg production is simply the minimum required for the perpetuation of the race. If, nowever, the cycle is disturbed, as for example, by the eggs being removed from the nest as fast as they are laid, a very considerable increase in the total number of

eggs produced will result. This, of course, is what happens under domestication. What an effect in increasing the actual expressed fecundity of a wild bird the simple removal of eggs as fast as they are laid may have, may be illustrated by three cases from the literature. Austin shows that whereas the wild Mallard duck in a state of nature lays only 12 to 18 eggs in the year, it will lay from 80 to 100 if they are removed as fast as laid and the bird is kept confined in a pen at night. Hanke by regularly removing the eggs got 48 in succession from a common wryneck (*Inyx torquillaz*). Wensel



A combined Roosting House and Scratching Shed. [Copyright.

This is the form used on the small poultry farm described on pages 57 to 59.

in the same way brought a house sparrow's productivity up to 51 eggs.

With the domesticated *Gallus* the 'normal ovulation' factor may be taken as inducing a production of anything up to from forty to eighty eggs in a year, this production being spread over the period of from sometime in February to September or October. In this physiological complex are involved the elaboration and deposition of yolks, the rapid growth of a few oöcytes just preceding ovulation, ovulation itself, the activation of the oviduct, etc. The details of some of the processes involved have been described elsewhere (cf. Rubaschkin, Sonnenbrodt, Pearl and Curtis, and Pearl and Surface) and do not concern us here. The essential point to be noted is that in this normal ovulation factor we are dealing with the basic physiological processes of normal 'unimproved' laying. To make a normal laying hen it is necessary to have present both the anatomical basis discussed above and the physiological basis,

³ I give this scientific name with much hesitation, not knowing what pranks the rule of priority or other nomenclatorial disturbers of the peace may have played with it in recent years. In any event the common name will quite sufficiently indicate what bird it is that is here under discussion.

which has been designated the normal ovulation factor.

It is a fact well known to poultrymen, and one capable of easy observation and confirmation, that different breeds and strains of poultry differ widely in their laying capacity. In saying this the writer would not be understood to affirm that a definite degree of fecundity is a fixed and unalterable characteristic of any particular breed. The history of breeds shows very clearly that certain breeds now notably poor in laying qualities were once particularly good. One of the best examples of this is the Polish fowl. But, in spite of this, inheritable breed and strain differences in fecundity exist, and probably always have existed. Such inheritable differences are independent of feeding or any other environmental factors. Thus the strain of Cornish Indian Games with which I have worked are poor layers, regardless of how they are fed or handled. This is merely a statement of

the work of the Station, low-producing lines have been propagated for experimental purposes to a much greater extent than would be the case in purely random breeding of the Maine Station's stock of the Barred Plymouth Rock breed. To make a perfectly just comparison between Cornish Indian Games and Barred Rocks, the strains of the latter deliberately bred for low egg production should be excluded. It has, however, in the present case been deemed best to take the whole flock of Barred Rock pullets for the laying year 1910—11, without any selection. The comparison is sufficiently striking even on this basis.

A series of tables and diagrams give the results arrived at in detail of the experiments made. Dr. Pearl then proceeds to discuss

THE ANATOMICAL BASIS OF FECUNDITY.

Since, as already pointed out, egg production obviously depends in part upon the presence of ova



General view of the Breeding Pens at Clayton Priory Farm.

[Copyright.]

particular fact; it does not imply that there may not exist other strains of Cornish Indian Games that are good layers.

The difference between this strain of Cornish Indian Games and Barred Plymouth Rocks, when kept under the same conditions and managed in the same way, is shown in tables 1 and 2, which give the frequency distributions and constants respectively, for flocks of these breeds kept at the Maine Station. The birds included in table 1 were all pullets, hatched at approximately the same time, and reared, housed, fed and cared for in all respects similarly. The Plymouth Rock distribution includes birds of both high and low fecundity strains. The low producing birds lower the mean in what is really an unfair manner, so far as concerns breed comparisons. The point is that, in

in a normal ovary, a question which demands consideration is the following:—

To what extent are observed variations in fecundity (i.e., in the number of eggs laid) to be referred to anatomical differences? In other words, does the ovary of a high producing hen, with for example, a winter record of from 75 to 115 eggs, contain a larger number of oöcytes than does the ovary of a hen which is a poor producer, laying no eggs in the winter period and perhaps but 10 or 15 eggs in the year?

To get light upon this question the observations to be described have been made. The object was to arrive at as accurate a relative judgment as possible regarding the number of oöcytes in the ovaries of different individual birds. It is, of course, impossible practically to determine accu-

ately the total absolute number of oöcytes in the ovary. What can be done, is to count the number of oöcytes which are visible to the unaided eye. While such results do not tell us, nor enable us to estimate with great accuracy, the total number of oöcytes in the ovary, they do nevertheless, throw interesting and useful light on the question raised above.

The counts of the visible oöcytes for a number of birds are given in table 4. These counts were made at my suggestion by my assistant, Miss Maynie R. Curtis, to whose painstaking care and skill in carrying through the tedious business of counting it is a pleasure to acknowledge gratefully my indebtedness. Prof. W. F. Schoppe, of the University of Maine, is carrying this work forward, and later we hope to be able to publish more extensive data. So far as I am aware the counts here given are the first attempt yet made at anything more than the roughest sort of a guess at the number of eggs in a bird's ovary. While these counts do not give the total numbers they do establish minimum values. A given ovary certainly does not carry any less than the number of visible ova.

A word should be said as to the method of making the counts, and the meaning of the subdivisions of the table. The counts were made in some cases on fresh, and in other cases on preserved ovaries. There was found to be little difference in the two methods, as regards the ease and accuracy of counting. In making the counts small pieces of ovary were cut off, and teased apart with needles under water and the visible oöcytes on the small fragments counted. In delimiting boundaries where a number of small oöcytes were closely packed together, a hand lens was used. No oöcyte was counted, however, which could not be seen with the unaided eye. In other words the lens was not used to find oöcytes which might otherwise be missed, but merely to aid in the dissecting of the material.

In the oöcyte counts given in the table it will be noted that these are grouped into four categories. The first class includes ruptured follicles from which the ova have been discharged. A ruptured follicle which is large at the moment the ovum leaves it gradually shrinks in size and is more or less completely absorbed. On the ovary of a hen which has laid, however, there will always be found a certain number of these discharged follicles not yet absorbed. When such follicles get very small it is exceedingly difficult to distinguish them from small oöcytes (i.e., undischarged follicles). Undoubtedly there are errors in classification in this respect in the counts, but for present purposes this is not a matter of great importance. If the eye were sharp enough it might perhaps be possible to distinguish a ruptured follicle for every egg which has ever been laid, since it is doubtful if the absorption is ever so complete as to leave absolutely no scar. It is of interest to note that in the counts there is a reasonably close relation between the follicle count and the record of eggs laid.

The oöcytes proper are divided in the counting into three classes: those 1 cm. or over in diameter, those between 1 mm. and 1 cm. in diameter, and those less than 1 mm. in diameter. The first of these classes includes the large yolks nearly ready to leave the ovary and pass into the oviduct. They are in process of rapid enlargement by the deposition of yolk. The next class includes those oöcytes in which yolk deposition is started but is proceeding at a slow rate. It is from this class that the first class of rapidly growing yolks is constantly being recruited. Finally the "under 1 mm." class represents the make-up of the bulk of the ovary. It will be understood that these size classes are only roughly delimited, the diameter of each oöcyte having been estimated but not carefully measured.

Columns in the table are devoted to "Total number of eggs laid in life" and "Winter production." The first of these has no particular significance since obviously it depends on when the bird was killed in order to make the oöcyte count. Winter production, however, represents a definite entity in fecundity as already pointed out above.⁶ Winter production records are directly comparable with one another. It is the inheritance of this fecundity unit that is primarily being studied in these investigations.

From this table a number of points are to be noted. In the first place it is clear that the number of visible oöcytes in the ovary of a hen is very large; much larger, I think, than has generally been supposed. While to be sure there are for the most part only vague statements respecting this point in the literature, usually these statements are to the effect that the bird's ovary contains 'several hundred' ova. The only direct statement as to the actual number of oöcytes in a hen's ovary which I have been able to find is given by Matthews Duncan on the very dubious authority of Geyelin to the following effect: "It has been ascertained that the ovarium of a fowl is composed of 600 ovula or eggs; therefore, a hen during the whole of her life cannot possibly lay more than 600, which in a natural course are distributed over nine years in the following proportion." This statement is followed by an utterly preposterous and presumably entirely imaginary table from Geyelin, supposed to show the laying of hens at different ages. How far from the truth the table is is indicated by the fact that according to it the pullet year is the least productive of any of a hen's life, save only for the ninth year, when the last remnants of the original 600 eggs are being tardily and, one must suppose, sorrowfully ejaculated!⁷ As a matter of fact repeated trap-nest and other tests in all parts of the world have shown again and again that, on the average, the pullet year is the most productive of a hen's life.

⁶ For general discussion of "winter production" as a unit of fecundity, see (28), (30), (34), (37), (38). It comprises the egg production up to March 1st of the laying year.

⁷ It is difficult to understand how so acute an investigator as F. H. A. Marshall could have been so imposed upon by this wonderful table of Geyelin's as to republish it in his valuable and interesting book on the "Physiology of Reproduction."

From the figures given in Table 4 it is furthermore apparent that the absolute number of oöcytes in the hen's ovary is very much larger than the number of eggs which any hen ever lays. A record of 200 eggs in the year is a high record of fecundity for the domestic fowl, though in exceptional cases it may go even a hundred eggs higher than this. But even a 200-eggs record is only a little more than the tenth of the average total number of visible oöcytes in a bird's ovary, to say nothing of the probably much larger number of oöcytes invisible to the unaided eye, but capable of growth and development. In other words it is quite evident from these figures that the potential 'anatomical' fecundity is very much higher than the actually realised fecundity. This is true even if we suppose the bird to be allowed to live until it dies a natural death. Experience shows that birds which make a high fecundity record in the first year of their life, generally speaking, never do so thereafter. In general an examination of what long period records are available in the statistics of this Station, and also in the literature, indicates that probably only relatively few birds of the American or Asiatic breeds at least, would lay many more than 400 to 500 eggs in their natural life time, if they were allowed to live it out. Records of '1000-egg' birds are in existence, but such birds are rare.

One of the longest continuous egg records of an individual bird, which may be considered accurate, with which I am acquainted is that given by Handrik (for a Leghorn). This bird was hatched in 1901. Its egg record was as follows:

Calendar year			Eggs laid
1902	...	...	105
1903	...	...	163
1904	...	...	138
1905	..	...	159
1906	...	...	160
1907	...	...	133
1908	...	...	111
Total ...			969
Average per year ...			138 3-7

Heier gives a four-year record for a Braekel hen, which is distinctly higher than would usually be obtained over so long a period. The figures are as follows:

Laying year			Eggs laid
First	...	...	153
Second	...	...	139
Third	...	...	152
Fourth	...	...	162
Total ...			606
Average per year ...			151 1-2

In this connection the paper of Dackweiler is of interest. Both of the cases here cited are of fowls of the Mediterranean type, in which the tendency to accumulate body fat with advancing age is not marked. I know of no records comparing with these in extent for Plymouth Rocks or other

American or Asiatic breed. After two years the fecundity of Plymouth Rocks, in all cases which have been observed at the Maine Experiment Station, becomes greatly reduced.

An examination of Table 4 in detail indicates that there is no very close or definite relationship between the number of visible number of oöcytes on the ovary and the winter production of a bird. Thus No. 1367 and No. 3546 each have about the same number of visible oöcytes, yet one has a winter production record 18 times as great as the other. Again No. 71 with the extraordinarily high winter record of 106 eggs has only a little more than one-half as many visible oöcytes as has No. 2067, whose winter production record is only 32 eggs. Again No. 71 with its 106 record has very nearly the same oöcyte count as No. 8010 with a winter record of zero. In general it may be said that the present figures give no indication that there is any correlation between fecundity as measured by winter production, and the number of oöcytes in the ovary. Of course, the present statistics are meager. More ample figures are needed (and are being collected) from which to measure the correlation between actual and 'anatomical' fecundity.

But the data now in hand, even at the very lowest valuation which may be placed upon them, indicate clearly, it seems to me, that there must be some other factor than the anatomical one involved in the existence of different degrees of actual fecundity in the domestic fowl. It clearly is the case from Table 4 that when one bird has a winter record of twice what another bird has it is *not* because the first has twice as many oöcytes in the ovary. On the contrary it appears that all birds have an anatomical endowment entirely sufficient for a very high degree of fecundity, and in point of fact quite equal to that possessed by birds which actually accomplish a high record of fecundity. Whether or not such high fecundity is actually realized evidently depends then upon the influence of additional factors beyond the anatomical basis. As has already been indicated in the preceding section it is reasonable to suppose that these factors are physiological in nature. The record of hen No. 71 shows most clearly and distinctly the reason why we must assume that there are definite physiological factors at work in determining relative degrees of fecundity, as measured by winter production.

While there are no oöcyte counts yet available for wild birds it is possible that when made they will show the same point as is here brought out, namely that there is no close or definite relation between the anatomical endowment and actually realized fecundity. In this connection a statement made by Jenner a century and a quarter ago regarding the cuckoo is of interest. He says:

"That the cuckoo actually lays a great number of eggs, dissection seems to prove very decisively. Upon a comparison I had an opportunity of making between the ovarium, or

racemus vitellorum, of a female cuckow, killed just as she had begun to lay, and of a pullet killed in the same state, *no essential difference appeared.*s The uterus of each contained an egg perfectly formed and ready for exclusion; and the ovarium exhibited a large cluster of eggs, gradually advanced from a very diminutive size to the greatest the yolk acquires before it is received into the oviduct."

8 Italics not in original.

HINTS ON PURCHASING POULTRY.

By F. JAY ARNOTT.

WHEN buying birds from a stranger, if the vendor's house cannot actually be visited and his stock of poultry inspected, then it should be insisted upon that the birds be sent on approval, or what is better still, that the purchase money be deposited with the Editor of a poultry journal

TABLE IV.

Showing the number of visible oöcytes in the ovary of certain birds.

Case No.	Bird No.	BREED.	DATE OF HATCHING.	DATE KILLED.	Total number of eggs laid in life.	Winter Production.	Discharged follicles.	Oöcytes 1 cm. or over in diameter.	Oöcytes 1 mm. to 1 cm. in diam.	Oöcytes under 1 mm. in diam.	Total visible oöcytes.
1	8021	Barred Plym. Rock ...	June 1, '10	March 28, '11	10	3	17	9	53	1149	1228
2	8017	Barred Plym. Rock ...	June 2, '10	March 30, '11	10	0	12	7	51	1596	1666
3	8030	Barred Plym. Rock ...	June 1, '10	March 10, '11	7	0	8	5	62	839	914
4	8005	Barred Plym. Rock ...	June 2, '10	March 14, '11	17	5	12	8	68	1096	1174
5	1367	Barred Plym. Rock ...	April 28, '10	April 4, '11	34	3	49	7	29	2121	2306
6	8018	Barred Plym. Rock ...	June 2, '10	March 24, '11	16	0	23	6	42	1123	1194
7	8009	Barred Plym. Rock ...	June 2, '10	March 24, '11	15	0	17	6	49	2029	2101
8	8010	Barred Plym. Rock ...	May 19, '10	March 17, '11	19	5	24	5	92	1455	1576
9	425	Barred Plym. Rock ...	March 30, '09	July 7, '10	23	0	21	12 ^a	142	1346	1521
10	3546	White Leghorn ^b	May 18, '09	December 20, '10	198	54	75	c	231	2146	2452
11	2067	White Leghorn.....	May 28, '09	December 15, '10	197	32	217	1	108	3279	3605
12	3453	White Leghorn.....	May 21, '09	December 13, '10	10	0	11	c	75	1626	1701
13	3833	White Leghorn.....	June 14, '09	December 22, '10	2	0	43	c	80	2022	2145
14	52	Cornish Ind. Game ...	April 21, '09	July 12, '10	52	13	54	6	167	1323	1550
15	71	F ^a Cross	March 31, '10	March 20, '11	124	106	50	5	70	1875	2000
16		Guinea hen	?	January '11	?		9	3	36	717	765
17		Guinea hen	?	January '11	?			3	38	545	586

^a This includes 8 yolks in process of absorption.

^b For this and the three following birds I am indebted to Prof. James E. Rice, of Cornell University, who very kindly gave me these trap-nested individuals for use in the present study. The egg records in these cases are not the records for life, but the records up to November 1st 1910. The figures represent practically the total production.

^c Birds not in laying condition when killed.

THE POULTRY CLUB.

The monthly meeting of the Council was called for Friday, October 10th, 1913, at Oxford Court, Cannon Street, E.C., at 2 p.m.

Mr. C. Thellusson and Captain R. Allen wrote expressing their inability to attend.

At 2 o'clock Dr. Dunkin, Messrs. W. Clarke, W. Rice, C. W. Goode, P. H. Bayliss, and T. Threlford (Hon. Sec.) were the only members present, and after waiting until 3.45, departed, no business being done for want of a quorum.

A special meeting of the Council will be held at the Dairy Show to dispose of the agenda.

T. THRELFORD, *Hon. Sec.*

A well-known Yorkshire Farm.

We are interested to know that Mr. and Mrs. P. T. Pyne, of Ravenscar, Yorkshire, have recently exported a consignment of their recording-nest strain of white Leghorns to Australia. These were specially ordered by an old customer of theirs in order to give vigour and to reinforce the productiveness of some white Leghorns of the well-known Padman strain. We are interested also to learn that the offspring of the union are to be entered in the Laying Competition in Australia.

(there are many such, having a deposit system for the benefit of their readers) and held by him until a satisfactory deal has resulted, when, he being informed, forwards the money on to the vendor. Such precautions as these are really very necessary, for unfortunately there are many "crooks" in the poultry business now-a-days, and all honest breeders are only too pleased to agree to the above terms. When the birds do arrive, they should be fed and watered and allowed to rest for a few hours, when they should be carefully examined, for signs of health or disease. The breathing of each bird should be carefully noted, both before and after handling. If the breathing appears spasmodic, it is a sign that the bird is in an over-fat condition, whilst prolonged breathing shows that there is an obstruction of some kind in the air passages. Of course, in noting the breathing, due allowance must be made for any exertion on the fowl's part due to our handling. Next, the bird's mouth should be opened, and the inside carefully examined, to see that there is no mucus or cheesy growths therein—as if such are present, the bird is suffering

from roup. The eyes and nostrils also need examination, as should there be a watery, or thick offensive discharge from either, the bird has a heavy cold, or roup. If the comb is shrunk or shrivelled with a purple tinge, and the face appears hollow, and of a yellow hue, with sunken eyes, the bird has a diseased liver. The excreta should also be noticed, as if there is an excess of whitish-coloured matter in it the bird has unhealthy kidneys, whilst greenish or yellow droppings indicate liver disease. The hand should be passed over the whole of the bird's body, so as to make sure that there are no deformities. The eye of a healthy bird is full and bright, the comb and face a clear red (making due allowance for age, climatic conditions, &c.), the plumage unruffled, and a general alert appearance shown all round. Under no circumstances whatever put a newly-purchased bird among other birds until it has been kept in quarantine for seven or ten days. Many highly-contagious diseases are spread through inadvertently introducing an infected bird among unaffected ones.

THE CHOICE OF A BREED.

THIS is a time of year when many people take up poultry keeping, and they are at once faced with that very momentous question as to which is the most suitable breed with which to begin operations. This question is very difficult to answer, since it involves the problem of strain. Advice may, however, be given as to the choice of a breed. There are breeds to suit every purpose, and every class of poultry keeper. Some varieties are better adapted than others for confinement, some excel in early table properties; some as summer, and others as winter layers; breeds that are delicate, and some that are hardy. Before attempting to advise in the choice of a breed, all the above circumstances must be duly considered. The first point that should be regarded is the local demand, i.e., whether eggs or table chickens, are in greater request, then breeds should be selected accordingly. Suppose the district is a large industrial centre, then the production of eggs is usually of primary importance, and there is more likelihood of meeting this demand if breeds of different types are kept. If White Leghorns and White Wyandottes are chosen, and providing they are of good reliable laying strains, and were hatched at the right time of year, no difficulty should be experienced in getting satisfactory results. Leghorns possess the characteristics that denote prolificacy, they are small and compactly built, bright, sharp, and active, they are good foragers, and owing to their energetic temperament can bear the cold much better than is usually expected of a non-sitter. The Wyandotte—white for preference—is extremely hardy, and the general testimony from all parts of the country is that a larger percentage of the years' egg yield are produced in winter from this species than from any

other breed. There is no doubt whatever that this breed is an extraordinarily good winter layer, so that by keeping the two breeds, a more regular supply of eggs, both winter and summer, may reasonably be expected, than were dependance to be placed upon the one type. The choice in this case is equally suitable for the farmer with plenty of land for his poultry, and for the small poultry keeper whose space is limited, since the two breeds will thrive excellently in confinement.

If choice has to be made of a breed for supplying good quality table chickens it will invariably be found that a first cross will answer the purpose infinitely better than a pure breed, since early growth is encouraged, and greater size is attained. The early growth of table birds should be watched carefully. These two essentials should be extended to them:—a light soil to run upon and adequate sheltering. Unless every effort is made to rear them quickly so that the minimum of time and labour is expended upon them it is useless to cater for this branch of the industry. An Indian Game male bird crossed with Faverolles, Sussex, or White Orpington hens will produce chickens that are sufficiently hardy to be satisfactorily reared during the early months in which it is necessary to hatch them if they are to be placed on the market at the time when they command the highest prices. The flesh of the chickens of these crosses is abundant, of good quality, and they are rapid in growth. In this direction the Indian Game-Faverolles can be placed first. It is very doubtful if any other pure or cross-bred chickens, can surpass, and few equal them. To obtain the best results with table breeds it must, however, be remembered that they should not be kept in confinement. The parent stock should have freedom, as also should the chickens during the early stages, so that they may develop the necessary size of frame before the fattening process commences.

In choosing a breed which will fulfil the two-fold purpose of a layer, and a table fowl, while no one breed will excel equally in both qualities, yet there are several breeds that are very fair in each, and the poultry-keeper will not go wrong in selecting either Buff Orpingtons or Faverolles. They are remarkably good layers, and the surplus cockerels will always find a ready sale for table use.

Cold Storage in the United States.

In the U. S. agricultural statistics some very interesting figures are given relative to cold storage. It is stated that in the year 1910-11 ten million cases of eggs were stored, or thirty six thousand millions, equal to 80 per cent of the total consumption of eggs in the United Kingdom. The storage cost worked out at 1½d. per dozen. Of these 67 per cent. were stored in April and May. The total value was estimated at 64,000,000 dollars (£12,800,000) which shows the enormous extent to which this system has grown. Further figures are given indicating that the average increase in values has advanced from 1893 when cold storage was introduced is 17·3 cents (8½d.) to 21·2 cents (10½d.) One other result is the range of values has decreased as an effect of a steadier market.

SICILIAN BUTTERCUPS.

BY BLANCHE H. STANTON.

FOR some time past the poultry fancy have talked and written Sicilian Buttercups here. Some charming articles have appeared on the subject, but later many authors have rushed into print, regardless of the fact that they are blazoning to those in the know that they can never have set eyes on the breed, and are not even "au fait" on the requirements of the American Buttercup Club standard. Thrilling accounts of pedigree, how to produce Buttercup combs, necessary crosses, type,

riot on the Mediterranean shores, and from which it is said the Flowerbird name was derived. The origin of the breed is unknown. They were ubiquitous in Sicily and some parts of the Italian coast before the "Fancy" came into being. There are Flowerbirds in Sicily to-day as there were in the old days when the "Good luck" birds were used for sacrifices, and kept with ancient rites to turn the "Evil Eye."

Certain it is that anyone possessing pure bred Buttercups and making pets of them, must speedily



The first Sicilian Buttercup ever shown in England.—Birmingham Show, 1912.

The property of Miss Stanton, the author of the accompanying article.

colour, what not, have all found their place in the poultry press, and one can but wonder what picture can have been conjured up in the average British mind by this wild display of terminological inexactitudes.

We talk of the Sicilian Buttercups as the new breed. The bird is new to this country, and the Buttercups appellation is of recent American birth, but the Flowerbird of Sicily has held its sway for many a long year. Some 50 years ago the Flowerbird sailed the Atlantic and bit by bit the American Buttercups rose from the ashes of the past. Why Buttercups, is a question we may well ask, for there is nothing about the birds to suggest such a name, while on the other hand the curious scarlet combs do recall the wild red anemones that run

realise they are not dealing with ordinary barn door fowls. They run up trees like woodpeckers and are at their happiest perched on the topmost twig of the highest tree available. Driven from their stronghold they fly long distances, skim the ground and then start running at an astounding pace. Tame and friendly to a degree as long as you do not try to handle them, they will hop up on your knee and eat out of your hand, chattering all the time, and the minute you lay hold of them they are like fury balls, scratching and tearing, producing blood-curdling shrieks at the same time, and no amount of training in a show pen makes the least difference. What judges at shows can think of them one wonders, they certainly have not met with approval in A.O.V. classes so far. If

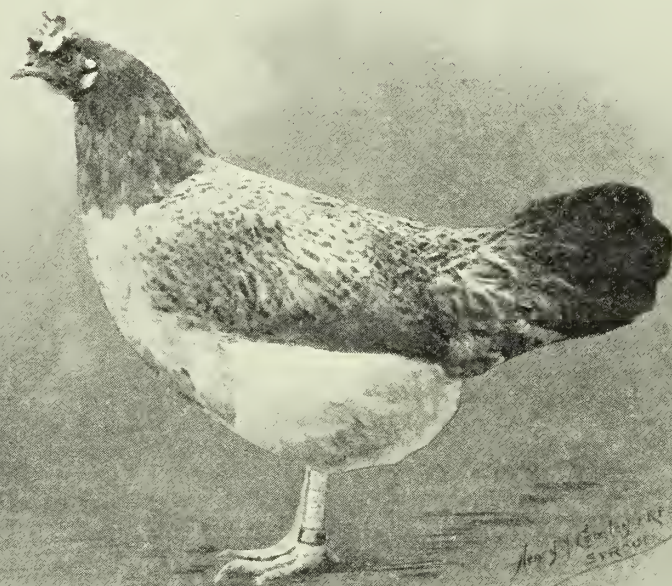
they are as wild with strangers as they are with their owners it is not surprising. An amusing incident occurred at the Royal Show. When our poultryman went to fetch the birds, having suffered many things from Buttercups, he ventured on a word of warning to the poultry attendant who was helping him to pack them. One can imagine the utter scorn of an old hand at such overtures, but alas, the next moment found him and half the tent full of people in hot pursuit of a fleeing Buttercup cockerel who dodged them all round the rows of pens!

It is a great waste of energy to try and keep growing Buttercups in separate pens, for when the

scattered fragments of cake round him.

Now-a-days we crave for originality so why begrudge the Buttercups their share.

The American Buttercups Club standard calls for a red coloured cock with black tail, long black sickle feathers and black wing flight, green legs, bay or red coloured eyes and the pretty flower shaped comb which is characteristic of the breed. The hen is maize yellow, shading to pearl grey, she has black spotted feathers on her back and wings, a black tail and flight feathers, red eyes, green legs and the same quaint comb, only smaller than the cock. The hens lay a great quantity of pure white eggs, and do not go broodie.



"Peerless"

A Sicilian Buttercup Hen from Mr. Dewey's winning pen at Rochester, America.

spirit moves them they deliberately scramble up the wire fencing, sit comfortably on the top strand and then fly to the chosen spot. They will be in this run one moment and you will find them the next, parading your lawn, or luxuriating in a showery dust bath in the middle of your most treasured begonia bed, or if they take a special fancy to you, you may be honoured with their presence at tea, through a conveniently open window, and you will find them raiding your cake dishes before you know where you are. One of my birds had on one occasion a grand field day. He came late and found a deserted tea table and a cake of comfortable dimensions. Half an hour later he was discovered fast asleep on the dish with

As for the chicks they are like balls of yellow fluff on little dainty green legs, curious dark markings on the head and back, and the tiny double comb just visible. Hardy and lively little things, full of vim, ever on the race, crouching in the grass like partridges when frightened, and sitting in a row on the hens back to rest.

Of course all this is from an enthusiastic Buttercup fanciers point of view, and no fancier worthy of his salt but thinks his geese are swans. Still, the little Flowerbird is so engaging and so pretty, that whether it comes from its island home of Sicily, or from America under the guise of the Sicilian Buttercups, it has come to England to stay, as a welcome addition to the British poultry fancy.

ECONOMY IN POULTRY MANAGEMENT.

By FRED. W. PARTON (*the University, Leeds*).

THERE are large numbers of poultry-keepers who do not sufficiently realise the limitations of the possible profit to be made from the work. That substantial profits may be made by all classes of poultry-keepers, from the general farmer who numbers his fowls by hundreds, down to the suburban dweller who, may be, has half a dozen. Yet to obtain this profit it is necessary for both the extensive and intensive operator to exercise the greatest economy in his methods of management, and instead of becoming obsessed by the idea that poultry-keeping will pay for all kinds of extravagant luxuries, one should realise that every penny judiciously expended means an enhanced return. Rightly to understand economy in management it must not be imagined that this simply means parsimony, and that everything of the cheapest must be purchased; this would be false economy, and the saving for the moment frequently means ultimate loss.

Probably the direction where the greatest mistake is made is in the purchase of stock birds, and this is a time of year when a word of warning may be of service. Frequently the importance of buying sound typical stock is overlooked, and birds are obtained that should never be included in the breeding pen. We have known farmers, and other classes of poultry-keepers, determine in favour of the cheaper cockerels simply because of a few shillings difference between the good and mediocre. After-results, however, have demonstrated the mistake. Of course, the utility breeder is not expected to pay the price that would be paid by the fancier, nor would it be deemed wise for him to do so. At the same time it is imperative when purchasing breeding stock that one should studiously adhere to the type of the particular breed. Of course there are certain extremes in some breeds after which the fancier craves, which should be disregarded by the utilitarian. At the same time the general standard should be observed, and it is wonderful, with a little practical experience, how quickly the eye becomes trained in the selection of what is required.

Further economy may be practised in the care and good management of chickens. The initial step in this direction is to hatch at the right time of the year. The poultry-keeper should, therefore, formulate at the outset a definite plan, and know at what age his birds will mature, then hatch accordingly. For instance, were he to hatch Leghorns and Anconas at the same time as Langshans or Plymouth Rocks, he would find that if the time of hatching was right for the latter breeds, the Leghorns and Anconas would probably lay about the latter end of August, or early in September, and then moult? on the other hand, if the time of incubation was suitable for the non-sitters, it would be too late for the heavy breeds, which might not

lay until the winter was far advanced. Consequently the two classes of fowls should be hatched at different times, the heavy breeds in February, March, and April, while the lighter breeds should be hatched in April and May. It is economy to rigidly weed out all faulty chickens from the commencement of their career, instead of which many are allowed to remain which become an incumbrance and eat food, without prospect of ultimately giving any return. They also add to the labour of rearing. Under a mistaken idea as to expense, appliances for the chickens are frequently not sufficient to accommodate the numbers that are crowded into them, so that, owing to congestion, the chicken's progress is considerably retarded, and thus for the saving in cost of adequate accommodation—which should never be denied young birds—they do not develop to such a degree or so rapidly as they would under sufficiently spacious conditions.

Another direction in which there may be great saving, is in the care of the appliances used both for chickens and adult stock. At the end of the hatching season, when incubators, coops, brooders, and chicken houses are no longer needed, they are frequently stacked away in an exposed place. The condition in which they are stored is exactly the same as when the inmates were removed. Small wonder that they are brought into requisition the following year in a dilapidated state, and so filthy, the chickens get a wretchedly bad "send-off." Instead of this slipshod method the appliances should have proper attention and care before being stored for the winter. Incubators should be thoroughly overhauled and cleaned when the last batch of chickens are removed. They will be sweet and fresh for the first hatch of the following season. There is also room for economy in the working of the incubator, not, of course, in the saving of oil, since this is inevitable, but by skillful treatment of the machine, and attending to the essentials, such as cleaning and trimming lamps—which should be done some distance from the incubator, so that the smell of oil does not penetrate the egg chamber—this goes far to keep a steady temperature, consequently better hatching results may be secured without any extra cost.

In many poultry yards an enormous amount of food is wasted every year, and it is in feeding where the poultry-keeper can practise the greatest economy. This does not mean giving insufficient food, since this would be the height of folly, and quite the reverse to economy. The food should be of the right kind; there are certain foods which contain just the necessary elements needed for egg production, and other foods equally suitable for fattening properties. Therefore foods should be selected according to the object in view, thereby getting the full value for every grain of food that is consumed.

A CORNELL POULTRY HOUSE.

Working plans of an excellent type of poultry house, erected at the Cornell University, U.S.A., having pens 12 feet square, are shown in Figures 1, 2 & 3.

THIS house is recommended for farm flocks of fifty to seventy fowls. For such a flock it should have two pens. This makes it possible to keep the old fowls separated from the pullets, or, better still, to keep the best fowls for breeding in one pen, separated from the others.

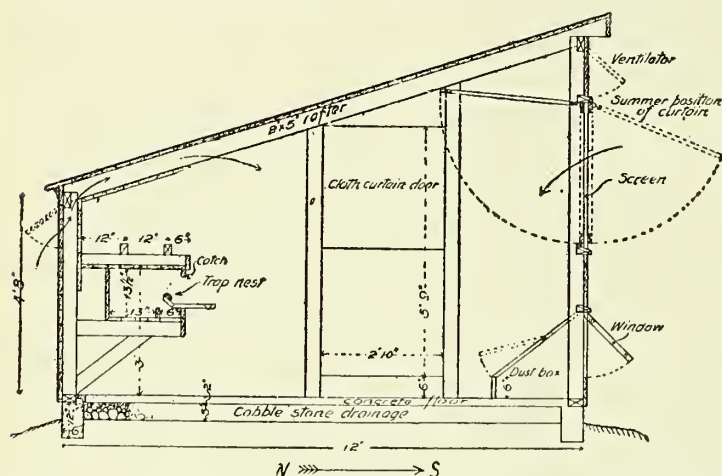


FIG. 1. A cross-section plan of the Cornell poultry house with pens 12 feet square.

The size of the muslin curtain should be varied in different parts of the State. In the extremely cold counties a curtain only 4 feet long and $2\frac{1}{2}$ or 3 feet high would be more satisfactory. The front elevation plan, illustrated in Fig. 2, shows a curtain 5 feet long and 2 feet 10 inches high. This is suitable for medium temperatures.

The foundation and floor of this house are of concrete. A wall 6 inches thick and 12 inches high (7 inches above the ground) is built above a trench filled with cobblestones. The trench should be about 1 foot deep, except in a very cold climate and on a heavy soil, in which case it should be deeper. The concrete floor is 2 inches thick and consists of rough concrete only. This is made of one part of cement and six parts of medium gravel; or one part of cement, two parts of sand, and four parts of screened gravel or stone. These are mixed together until the mass shows a uniform color, then water is added and mixed in until the whole is thoroughly wet. This mixture is then tamped into place and the surface floated level and smooth with a board float. If a smoother finish is desired, the surface should be trowled after it has partly dried and started to set. The concrete rests on 5 inches of cobblestones and gravel, or hard cinders (not coal ashes). This coarse material separates the concrete from the moist earth and keeps the moisture from coming up through the concrete.

In many cases, where the stone or gravel filling is very shallow, or where the ground is very heavy and damp, it is well to insure dryness by using tar

paper beneath the concrete or by adding air-slaked lime. When using tar paper, level, dampen, and pound down the gravel filling. Sweep a light coat of clean sand over the gravel so as to protect the paper from being cut by the coarser parts of the gravel, and lay over this smooth surface one thickness of one-ply tar paper with edges overlapping one half the width of the paper; or, better still, use three layers of one-ply tar paper with a coat of tar paint between the layers. Over the tar paper spread the 2-inch layer of rough concrete, as described above. In addition to preventing the upward passage of water, the tar paper prevents the downward passage of heat, thereby providing a warmer floor.

When moisture-proofing the concrete with lime, add an equal part of air-slaked lime to the cement and mix thoroughly before adding to the sand and gravel. This latter method, however, does not give so strong and satisfactory a floor as does the former.

The house is ventilated in winter by the cloth curtain, and in summer by a small door at the top of the front side, by opening the glass window, and by the small door at the top of the back side. The muslin curtain is hinged on the outside and fastened up to serve as an awning during the hot summer months.

The roosting closet is enclosed in the same way as in the breed-testing house.

The partition between pens should be made of

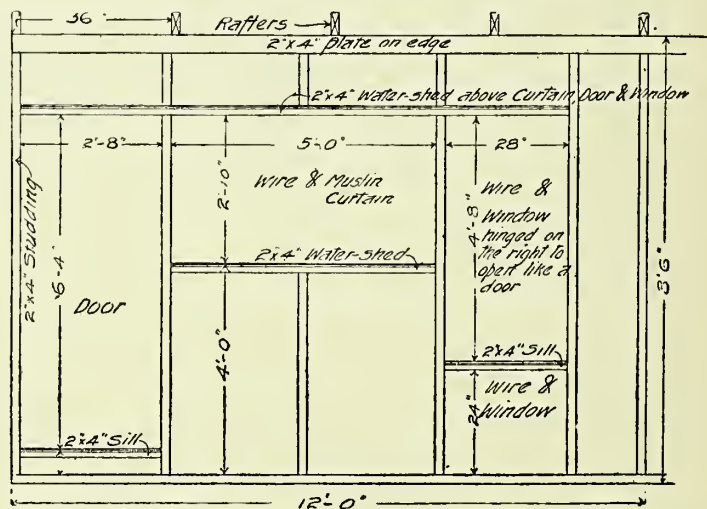


FIG. 2. Front elevation of the Cornell poultry house with pens 12 feet square, showing the frame construction.

wood alone, or of wood and cloth. The cloth should not be used where there is likelihood of striking and tearing it while cleaning the pens.

The nests are located beneath the droppings platform, and rest on a table attached to the rear wall. The nests shown in Fig. 1 are for traps.

The dust box used in this house is enclosed on all sides. The hens enter it through a small opening in the side. The covered wallow prevents a

ADVISORY POULTRY WORK.

As mentioned in our August issue special grants are being made by the Board of Agriculture and Fisheries to various institutions for advisory work in agriculture. In a leaflet just issued by the Board, entitled "Agricultural Education and Research in England and Wales" (No. 197) the following particulars are given :

Many enquiries on agricultural subjects, especially those likely to be made by small holders and others, as regards dairying, poultry-keeping, and gardening, can quite well be dealt with by the County Staff, but difficulties frequently arise which demand not merely skill and experience in agriculture, but special scientific knowledge and training.

It will be the duty of the staffs of the Institutions aided by this grant to devote themselves to the investigation of such local problems, while they will also form a link between the Research Institutions and the farmer.

The institutions selected up to the present, and the areas in which the services of the staffs are available, are as follows :—

Cambridge University—Bedford, Cambridge, Essex, Herts, Hunts, Lincs. (Kesteven), Lincs. (Holland), Norfolk, Northampton, Suffolk.
Bristol University—Gloucester, Hereford, Somerset, Wiltshire, Worcester.
Reading University College—Berkshire, Bucks, Dorset, Hants, Middlesex, Oxford.
Bangor University College—Anglesey, Carnarvon, Denbigh, Flint.
Aberystwyth College—Brecknock, Cardigan, Carmarthen, Glamorgan, Merioneth, Monmouth, Montgomery, Pembroke, Radnor.
Newcastle, Armstrong College—Cumberland, Durham, Northumberland, Westmorland.
Leeds University—Yorkshire.
South-Eastern Agricultural College, Wye—Kent, Surrey, Sussex.

Persons desirous of obtaining advice on difficult agricultural questions should communicate with the Advisory Officer at the Institution for the area in which they reside. In counties in which there is a County Agricultural Organiser agriculturists should communicate with that officer in cases in which the assistance required does not appear to be of a scientific or specially difficult nature.

Leg Colour.

Professor J. E. Rice, says : "High producers have pale shanks at the end of the laying season. Another important factor in selecting high producers is the colour of the shanks of the yellow-skinned breeds. If you were to examine the high-producing hens in the early fall, you would see that their shanks are 'laid out,' that is pale in colour. The hens that have had little to do during the Summer, except to loaf around and eat, usually have the finest kind of coloured shanks."

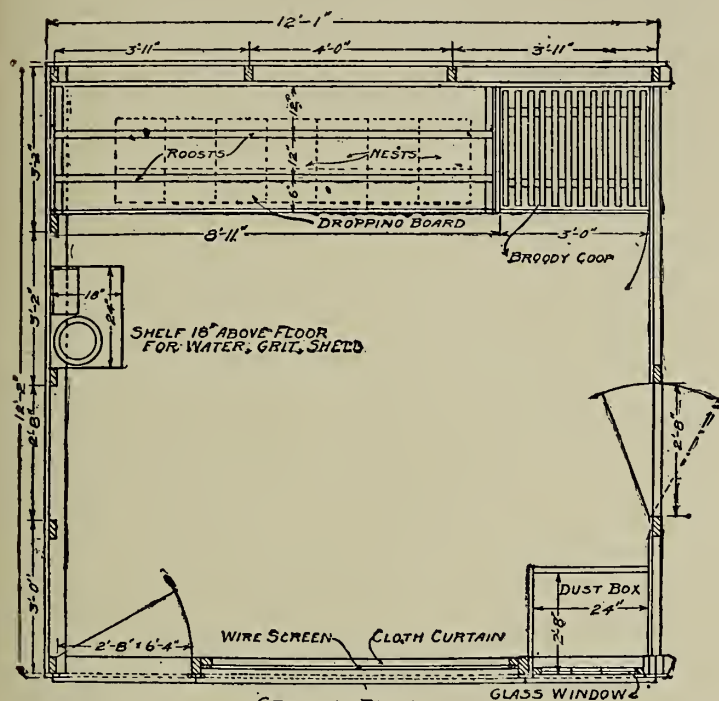


Fig. 3.

great deal of dust from getting into the open pen, although the fowls will often leave the box before shaking themselves.

THE UTILITY POULTRY CLUB.

Twelve Months' Laying Competition.

The report for the twelfth period of four weeks is to hand and shows very little variation in the places of the leading pens. Pen 60, White Wyandottes hold a winning lead over Pen 86, Buff Rocks, and unless some unexpected catastrophe overtakes them during the last four weeks there is little likelihood that they will be beaten.

Mr. Rhodes in his report draws attention to the fact that owing to many birds moulting the birds look rather ragged but many are getting well through the moult.

The total eggs laid for the month is 6218; the highest pen's total being 105 eggs laid by Pen 32, White Wyandottes, which occupies the third position.

The Competition closes on the 14th October, after which date the final report will be issued. This report should contain much interesting information and data of use to poultry keepers.

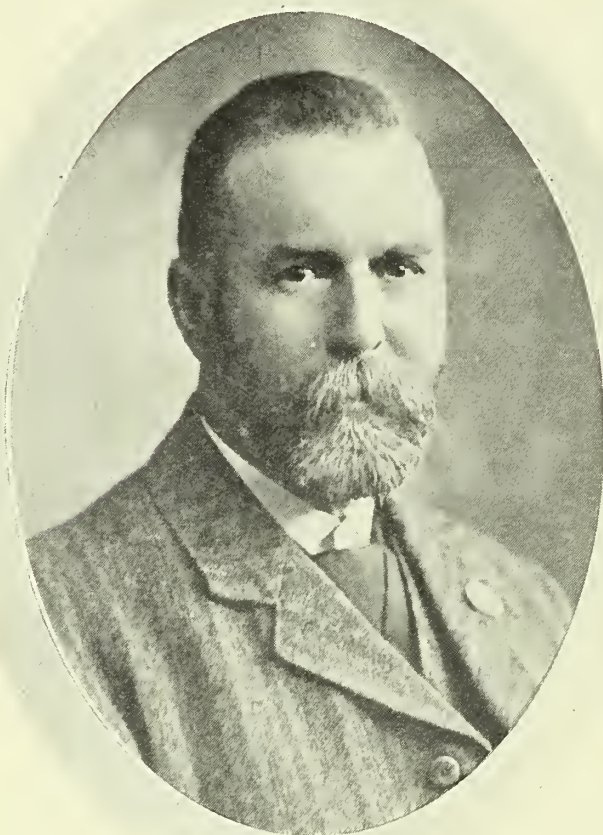
The following are the positions of the leading pens :—

Order.	No. of Pen.	Breed.	Total eggs to August 19th.	Total value to August 19th.
1	60	White Wyandottes	1284	£6 7s. 4 $\frac{3}{4}$
2	86	Buff Rocks	1136	£5 18s. 5
3	32	White Wyandottes	1204	£5 16s. 10 $\frac{3}{4}$
4	29	" "	1151	£5 6s. 6 $\frac{1}{2}$
5	24	Black Leghorns	1048	£5 2s. 10 $\frac{1}{2}$
6	35	White Wyandottes	1066	£5 2s. 4 $\frac{3}{4}$
7	45	" "	1041	£5 1s. 7 $\frac{1}{2}$
8	22	White Leghorns	1040	£5 0s. 1 $\frac{1}{2}$

POULTRY JUDGE'S RECORD.

Darlington man who has officiated at 1000 shows.

Mr. Robert Stainthorp, of Darlington, whose photo we reproduce, has just achieved a record by acting as a poultry judge at a thousand shows. Commencing in 1891, he completed the record in September last, and is now proceeding on his second thousand. His first show was at Bridlington, where he so pleased the exhibitors that he quickly



Mr. Robert Stainthorp.

had many more engagements. Mr. Stainthorp is also a well-known breeder of Plymouth Rocks, with which he has taken many prizes. Last year he sold the winning cock of the season. This was the one that took the cup both at the Club Show and at the Crystal Palace.

In his capacity of judge, Mr. Stainthorp has put in a lot of hard work, and has travelled thousands of miles.

On one occasion he left Darlington for Holland, where he arrived at mid-day on the Tuesday, and judged on the following day. Leaving on Wednesday night at 6-40 he reached London the following morning, and went straight to South Wales, where he judged on the Friday, going on to Lampeter to judge on the Saturday. He then took the night mail train for Darlington, which he reached at 5 o'clock on Sunday morning.

At another time he judged at Keith, about fifty miles north of Aberdeen, and left at 4.15 the same day, travelling all night, in order to judge at Bridlington on the following day. About six years ago he left Darlington at 4-52 a.m. on a Wednesday, and judged at Carlisle. The following day he was on duty at Selby, and on the Friday at Bulwell, near Nottingham. On finishing there he booked to Glasgow, and by travelling close on 300 miles, got there at mid-night. Then he had to catch the 6.10 a.m. for Lesmahgow, which he reached at 9 o'clock. He subsequently returned via Edinburgh to Darlington.

In addition to judging in Holland, Mr. Stainthorp has officiated in Jersey, the Royal Cornwall Show at St. Ives, all over the Isle of Man, and in most parts of Ireland. Only this summer he judged at the Royal Ulster Show, and the same week he adjudicated at Hebden Bridge. For the past five years he has been at the Crystal Palace Show, and out of about forty judges in the poultry section he has been one of the selected three to award on the second day, the championship prizes. These three judges had to select the three best male birds and the three best females, and from them decide the championship for the best cock and hen. Last year there were well over 2,000 exhibits, so it will be agreed that the task was no light one.

"HOME COLONISTS."

To the Editor of the ILLUSTRATED POULTRY RECORD.

Sir,—In the October issue of the ILLUSTRATED POULTRY RECORD, Miss Rowe, in her able article upon "Home Colonists," expresses regret that so many of our good countrymen should emigrate, when the same work that they set out to do could be accomplished over here.

With the principle set down I entirely agree, but I am sure Miss Rowe will forgive me if I say that she has missed the real difficulty of the matter.

There can be no doubt that there are hundreds of families as the example the writer mentioned who would be willing to move from one county to another instead of incurring the heavy expenses in going abroad; but it must be remembered that there are not one in twenty who are in a position to *buy* a residence. Mortgages are of course obtainable, but these are a rope around one's neck at the best of times. And that is where the difficulty comes in; there are not sufficient suitable places to be let.

Naturally, one can always find bungalows with four or five rooms, and such-like buildings, but when it comes to houses suitable for a family, and with adequate ground, then the difficulties arise.

As I have said, the principle that Miss Rowe sets forth is admirable, and one which many people would do well to take to heart; but we must first of all find a home with ground to be let before

such an excellent idea can be brought into practical operation.

In the same issue of the ILLUSTRATED POULTRY RECORD, that characteristic writer, Mr. J. Stephen Hicks, points out some facts regarding the production of new breeds.

Those who remember my earlier writings, not so very many years ago, will perhaps call to mind that I have always been among those who have failed to see the necessity of so many different breeds. No one can deny the fact that many of our present breeds require much improvement, and it seems to me that the talents which are brought to use in the making of new breeds would be better occupied in trying to improve those which we already have. I fail to see the use of such an endless variety of specimens, especially when it is considered that many of them are, from an utility point of view, worthless.

Yours,

REGINALD WILLS.

THE DURATION OF THE MALE INFLUENCE.

A very interesting report has been published by Professor J. L. Frateur, of the Zoological Institute at the Louvain (Belgium) University, entitled "The duration of fecundity of hens separated from the cock," recording results of three experiments made. These were as follows: (1) a Malines cock and six hens; (2) a Malines cock and four hens; (3) a Minorca cock and four White Orpington hens. The following table embodies the observations made:

days after cocks removed	No. 1 Pen.		No. 2 Pen.		No. 3 Pen.	
	Eggs laid.	No fertile	Eggs laid.	No fertile	Eggs laid.	No fertile
1	0	—	4	1	3	3
2	2	2	1	1	0	—
3	2	1	1	1	2	1
4	2	1	2	2	1	1
5	5	5	1	1	1	1
6	0	—	2	1	2	1
7	4	3	1	1	2	2
8	1	0	2	1	3	3
9	3	0	1	0	3	3
10	1	1	2	2	1	0
11	3	1	3	3	4	0
12	0	—	2	1	3	1
13	4	0	2	1	3	2
14	1	1	2	1	1	0

The observations were continued until the twenty-eighth day, but in the case of No's 1 and 2 lots no egg was found to be fertilised after the fourteenth day, and in the No. 3 lot after the thirteenth day.

A further report has also been published in order to indicate when fertilisation is produced after mating. Five lots of hens were used, all of whom had been kept separate from male influence for a period of forty days. The results were:

1. Minorca cock and White Orpington hens: 1st day, 2 infertile eggs laid; 2nd day, 3 eggs 1, fertile; 3rd day and onwards, all fertile.

2. Concon de Malines: 1st day, 4 eggs, all unfertile; 2nd day, 1 fertile egg; 3rd day, 3 eggs, 1 fertile; 4th day, 2 unfertile eggs; 5th day, 3 eggs, 2 fertile; 6th day, 3 eggs, 2 fertile.

3. Minorca cock and Orpingtons: 12 eggs laid in the first three days, all unfertile; 4th day, 3 eggs, 2 fertile; 5th day, 6 eggs, 3 fertile.

Minorca cock and White Orpington hens: 1st day, 4 unfertile eggs; 2nd day, 6 eggs, all fertile.

5. Concon de Malines: 1st and 2nd days 6 eggs, all unfertile; 3rd day, 1 fertile egg; 4th day, 4 eggs, 2 fertile; 5th day, 2 fertile eggs.

UTILITY POULTRY CLUB.

Twelve Months' Laying Competitions, 1913-1914.

The Laying Competitions at the Harper Adams Agricultural College, Newport, Salop and at Sedlescombe, under the management of Mr. J. N. Leigh and for which the Development Commissioners have made grants, both commence this month.

Entries have been received from all parts of the country, and although White Wyandottes and White Leghorns predominate, several breeds are represented.

The breeds entered for the Sedlescombe Competition, where accommodation was provided for 32 pens in each division, consist of the following:— 12 pens White Wyandottes, 11 pens White Leghorns, 2 pens Buff Orpingtons, 2 pens White Orpingtons and 1 pen each Buff Plymouth Rocks, Black Leghorns, Salmon Faverolles, Red Sussex and Rhode Island Reds.

The pens arrived on the 7th and 8th and the Competition started on the 11th October.

The Club have appointed Mr. T. R. Robinson, late of Wye Agricultural College, Mr. W. F. Snell (Lecturer to the Kent County Council) and Mr. S. C. Sharpe (Lecturer to East Sussex Agricultural College, Uckfield) as a Sub-Committee to inspect the arrangements and report on the Competition from time to time.

The breeds entered for the Competition at the Harper Adams Agricultural College, where accommodation is provided for 50 pens of 6 birds each, consist of the following:—

Twenty-four pens White Wyandottes, 15 pens White Leghorns, 3 pens each Buff Orpingtons and Buff Plymouth Rocks, 2 pens each of Black Leghorns and Rhode Island Reds and 1 pen Croad Langshans.

The birds are due to arrive on the 22nd and 23rd October and the Competition starts on the 25th October.

Mr. G. A. Palmer (Lecturer to Lincs. and Worcester County Council) Mr. Charles Longbottom, Hon. Sec. to the Northern Utility Poultry Society and Mr. F. W. Parton (Lecturer to Leeds University) have been appointed by the Club as a Sub-Committee for this Competition.

THE SUSSEX AS A UTILITY FOWL.

This breed combines all the necessary qualifications as a table fowl—white skin; tender and delicate texture; exquisite flavour; smallness of bone; a long deep breast carrying a quantity of meat; a ready fattener, taking the cramming process well; a quick grower; ready to kill at 12 to 14 weeks weighing $3\frac{1}{2}$ lbs. to 5 lbs.

The laying qualities are excellent; the eggs are fairly large often weighing over 2 oz.; tinted or brown in colour.

The popularity of this breed is rapidly increasing, the demand for pullets this season being much greater than the supply.

Mr. S. C. Sharpe, poultry instructor at the Agricultural and Horticultural College, at Uckfield, speaking about the Reds, says:—

“The Reds are very good winter layers. Strain, of course, must be taken into account. Some are much better than others, but this happens with all breeds. The eggs are of a good colour, and fair-size. None of the Sussex can be called layers of large eggs, but they are generally all of fair size and well over 2 ozs., and, therefore, saleable.”

“This variety has improved considerably in colour during the past year. One can now see at most of the large shows the real deep Red, such as we see in the Sussex cattle, and this is the colour we should try for—the rich, deep red, which will not fade and go yellow after the first season’s showing.”

Some very fine specimens of both Reds and Speckleds are to be seen at the Saunderton Poultry Farm on the Bledlow Ridge Estate.

The next Missouri Contest.

The *New Zealand Poultry Journal* states that six breeders in that country have entered pens for the forthcoming Missouri Egg Laying Competition, stung to some extent by the observations made by *Farm Poultry*. The result will be interesting.

A POULTRY EXPERIMENT.

Poultry Experiments (*The Pennsylvania State College Agricultural Experiment Station, Bulletin 120*).—This Bulletin contains an account of certain experiments (1) on the treatment of eggs held for hatching; (2) on crude fibre in the ration of laying hens; (3) on a comparison of simple rations with variety in feeding laying hens.

With regard to the treatment of eggs held for hatching, it is suggested that the daily warming by contact with the hen’s body, which eggs receive under natural conditions when the process of incubation is delayed, appears to have an important influence on the life and vigour of the embryo chick.

A summary of the results of tests carried out in 1910 and 1911 with a view to investigate this question shows that the average number of chicks hatched in incubators from a hundred eggs, which had been held prior to incubation for periods varying from 14 to 30 days, and which were not warmed was 33; from a hundred similar eggs which had been warmed under hens for sixty minutes daily, 43 chickens were hatched, being a gain of 10 per cent. on all eggs used. No particular advantage was



A Red Sussex Cockerel.

[Copyright.]

apparent from warming eggs that were held for a period of not more than ten or twelve days. It is contended that in handling the eggs in the incubators, the embryos of the warmed eggs, after being placed in the machine, presented a distinctly different appearance from those of eggs not warmed, being larger in size at the same period of incubation and appearing more vigorous. To be of practical value the warming of eggs reserved for hatching would require special apparatus, as it was found difficult to secure a proper temperature for the purpose by the use of incubators.

Experiments conducted in connection with washing eggs which were subsequently used for hatching, indicated that the “hatchability” of eggs was materially reduced by washing.

MOISTURE AS AN ESSENTIAL FACTOR IN ARTIFICIAL INCUBATION.

THE article by Herr. P. Sweers, Crefeld, Germany, on "New Lights on Artificial Hatching" appearing in the October issue of the *Illustrated Poultry Record*, is worthy of the notice and consideration of all operators of incubators. The subject is one which no practical poultry-keeper can afford to neglect, for it certainly brings forward new ideas on this important topic. It is too early as yet to say that Herr. Sweers has definitely solved the question of "dead in shell," but there appears to be certain facts in favour of his solution.

We do not propose to discuss the whole of the article in question, but desire to take one sentence as our text, namely, "The air in the incubator room must not be damper than the air over the eggs, otherwise there is no ventilation, especially towards the end of the incubation period."

Humidity in the atmosphere is calculated by degrees. Absolutely dry air is stated to have 0° humidity. Saturated air, stated to have 100° humidity, is that which holds as much water vapour in suspension as it is possible—if the temperature of such air is lowered the surplus water is deposited as dew. One fact which renders this question more difficult is that warm air is capable of containing a larger quantity of water vapour in suspension before saturation point is reached than is cold air. For example:—

AIR TEMPERATURE.

Fahrenheit.	Celcius.	Water vapour in cubic foot of saturated air.
50°	10°	4.1 grains
68°	20°	7.5 grains
86°	30°	13.2 grains
104°	40°	22.2 grains

The importance of this is realised when it is remembered that with incubators the room atmosphere is raised in temperature before being passed into the egg chamber. If no additional water is supplied to this ingoing air, it stands to reason that the warm air of the egg drawer must be drier than the surrounding atmosphere.

The humidity of the air in a well-ventilated incubator shed varies very considerably, even during the period of one hatch. Not only does the degree of humidity vary but also the room temperature, which increases the difference in the weight of water vapour per cubic foot.

From figures before us now, taken with special care, we find that in one hatching period of 22 days in the spring of the year, the temperature varied from 52°F (11.1°C) to 68°F (20°C), and the humidity from 50 to 67. Again on two occasions with a room temperature of 64°F (17.7°C) the humidity varied from 51° to 67°. The air in both cases was

raised to 104°F (40°C) when passed into the egg chamber, but with very different results as regards humidity. The following table will show:—

Air Temperature.	Degree of humidity.	Grains per cub. ft. of air.	Humidity at 104°F.
64°F (17.7°C)	51°	3.4	14°
64°F (17.7°C)	67°	4.5	18.8°

This variation took place in a well-constructed incubator house, but we have known the difference to be much greater. One record we have is of a reading of 37°F (2.77°C) with a humidity of 68°. This atmosphere raised to 104°F (40°C) would only give 7.6° of humidity in the egg drawer.

Without added water to the ingoing air, it would appear from the foregoing that the air in the egg-chamber must always be drier than the external atmosphere.

There is another point to be considered in this connection. A portion of the egg content is water, and this tends to evaporate. We have already remarked that warm air is capable of holding a larger quantity of water vapour than cold air, but more than this, the lower the degree of humidity in the air the more rapid is the evaporation of any water that may be present. Therefore, the evaporating power of air at 68°F (17.7°C) with 51° humidity is not nearly so great as the evaporating power of the same air when raised to 104°F (40°C), as in the case the degree of humidity only stands at 14.

We realise the difficulty that beset Herr. Sweers when trying to determine the humidity of the air in the egg drawer, for we have experienced the same. We have used a specially constructed hydrometer for this purpose and found that by disturbing the air with an electrically worked fan a very accurate reading could be obtained. This has been checked repeatedly by withdrawing a portion of the air and passing it through sulphuric acid tubes, by which means the weight of water vapour can be ascertained.

We appreciate the fact that ventilation and humidity are very closely allied, but we cannot quite understand the point brought forward by Herr. Sweers, namely that the humidity of the air controls ventilation. We are not conversant with the Sartorius, Kipp, Albrecht, and Sweers systems, but with tank incubators in this country, the air from the egg chamber passes out into the room by means of holes placed directly below the lower surface of the tank—the hottest part of the chamber—and the ingoing air passes through the floor of the machine—the coolest part. As this is the case, the rapidity of air circulation would seem to depend on the difference between the room temper-

ature and the egg drawer temperature, irrespective of the question of humidity.

It is impossible to say exactly what degree of humidity is desirable in the egg drawer, to allow of a constant evaporation of the liquid portion of the egg and at a defined rate, but it may be that this must be above that of the room atmosphere. A simple form of a hygrometer is required, or other instrument, so that particulars can be easily determined. As the labour entailed in making authentic readings is very great.

We agree that ventilation and humidity are two questions that must be answered together, but not for the same reason as Herr Sweers puts forward.

One contention is that both must govern the rate of evaporation from the egg. Our experiments indicate that a large loss in weight of the eggs during incubation not only effects adversely the hatchability of the eggs, but also the liveability of the resulting chickens.

From what has been said above, it will be manifest that air with a high degree of humidity passing rapidly through the egg chamber will have very much the same effect as drier air passing more slowly. Two things are needed. If we could ascertain the exact degree of humidity necessary for successful hatching, then hit on some plan by which we could read the variations in the humidity of the air as it is found in the egg chamber, we could regulate the evaporation of the liquid part of the egg—and consequently its loss in weight—by increasing or decreasing the flow of air through the egg chamber by means of ventilators.

In the above we have only dealt with tank incubators of the Hearson type. The whole subject takes in a different aspect when we consider hot-air non-moisture machines.

ANIMAL FOODS.

With a view of ascertaining what effect various kinds and quantities of animal food might have on the production and hatching power of eggs, an experiment was commenced in 1909, at the Ontario College. 125 Buff Orpington pullets were experimented with during the first year, 125 Rhode Island Red hens and pullets in 1910-11, and 100 Leghorn pullets in 1911-12. The animal foods used were: buttermilk, 10 per cent. dry mash beef scrap, beef scrap in hopper, and green cut bone. It was found that buttermilk produced the most and cheapest eggs. Where beef scrap was fed in the hopper the Leghorns and Rhode Island Reds did much better than the Orpingtons. In all cases birds which received no animal food produced the smallest number of eggs, but these eggs had the greatest hatching power. The Leghorns supplied with the ration containing no animal food developed the habit of feather-eating to a great extent and of the three breeds they appeared to be most in need of this class of food.

Co-operation in South Africa.

We learn from the *Cape Times* that the proposal to form a co-operative society for the sale of poultry and eggs has been advanced a stage further, and the prospectus should shortly be issued. The Western Province Agricultural Society have appointed Sir John Graham and Mr. C. Starke as delegates to confer with the representatives of the Government and the Cape Town Poultry Society as to the best means of forming the society. It is hoped that farmers and breeders will support the new venture both by sending in their produce and by taking a few shares. Current market rates will be paid for the produce, and the profits will from time to time be distributed amongst the shareholders. It is confidently anticipated that the society will be able to sell the eggs and table poultry at better prices than obtain in the market, as they will, of course, be able to guarantee that the eggs are new-laid and the poultry up to standard requirements.



On a large Danish poultry farm.

[Copyright.]

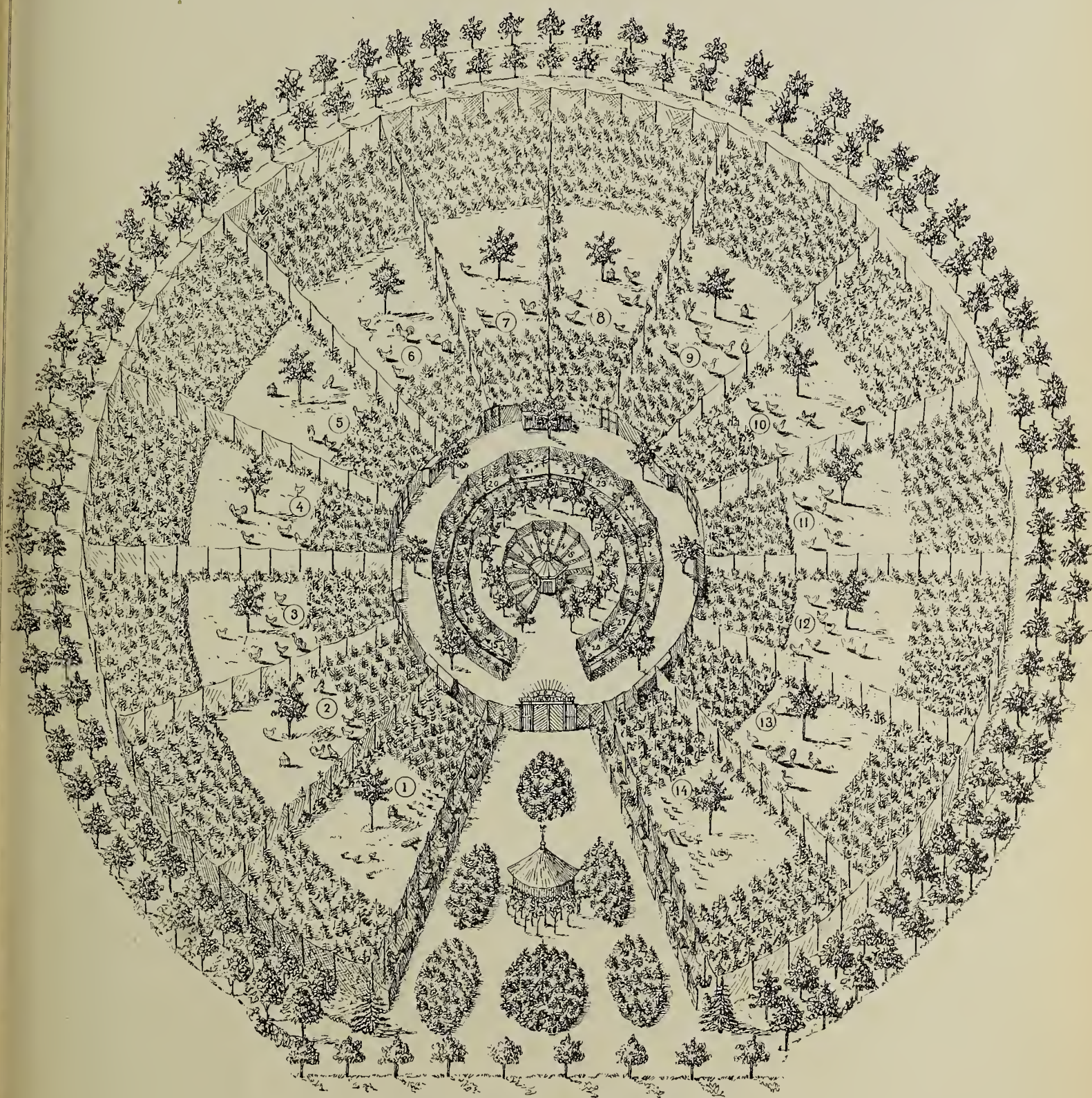
CENTRAL BREEDING STATION V.P.N. DRENTE, HOLLAND.

THE whole plan covers a superficial area of 7,500 m., and is laid out in a circular form divided into 17 large plots for hens, 17 smaller plots (sections) for waterfowls and 17 runs for chickens, all separated from each other by solid paths of 5 m. The central brood-house, which, with a well, forms the centre of the whole ground.

The large runs contain, fore and aft, wood, fir trees and heath; the central part is greenland.

The runs for waterfowls intersected by a wooden watercourse, which can be filled by pumping from the breeding house.

The chicken runs are situated next to the brood-



Plan of the Central Breeding Station.

house, and in the breeding-house there are some 5 brood-machines and artificial mothers.

One sector of the circle is kept free, but in same is a summer-house with separate runs built of wood for brooders and a few cocks. The whole ground is surrounded by a path with an alley of poplars.

The houses are very large and practical, simple but spacious, with a night-house measuring 2 by 2 m., and room for birds to run about measuring 2 by 7 m. enclosed by glass panels. Attached to every run is a small plate of iron bearing the name of the breed.

The establishment is populated with the strains mentioned in the illustration. This number will not be extended, but rather limited, if one strain proves to be less profitable than another. The breeding will be conducted on a purely scientific basis under the authorities control, which includes the feeding experiments also.

The breeding strains have been composed in concert with the counsel of Poultry Breeding.

The establishment is accessible for Members of the V.P.N. (Dutch Poultry Society) on showing their membership's ticket every week day from 2 to 7 and on Sundays from 1 to 7 p.m.

The provisional surveyor is Mr. Mulder at

Havelpe, whereas the supervision lies with the Department Board of Drent and the counsel for Poultry Breeding.

The following breeds are to be found in the station—

Run	1.	Chickens, cocks.		
"	2.	Drentish fowls, old race.	Colour white.	
"	3.	" " cultivated for		
		laying purposes.	"	"
"	4.	Dutch bearded fowl.	"	"
"	5.	Breda fowl.	"	"
"	6.	Leghorn fowl.	"	"
"	7.	Orpington, young pen.	"	"
"	8.	Wyandotte, "	"	"
"	9.	Cross-bred for laying purposes		
		(rose combed).	"	"
"	10.	Cross-bred for laying and flesh		
		purposes (single combed).	"	"
"	11.	Cross-bred for flesh purposes		
		(pea combed).	"	"
"	12.	Orpingtons, 3 years old pen.	"	"
"	13.	Chickens, hens.	"	"
"	14.	Dutch turkeys.	"	"
"	15.	Indian runner duck.	"	"
"	15.	Dutch common duck.	"	"
"	17.	Aylesbury duck.	"	"
"	18.	Peking duck.	"	"
"	19.	Dutch common goose.	"	"
"	20.	Cross-bred Peking and Indian		
		runner duck.	"	"
"	21-28.	Chickens from ducks and		
		geese.	"	"

It is to be pointed out that all races are in the white colour.

THE GENERATION OF CARBON DIOXIDE BY THE CHICK EMBRYO AND THE EFFECTS UPON ITS DEVELOPMENT.

Paper by Prof. Geo. H. Lamson, Jr. at the Sixth Annual Meeting of the American Association of Instructors and Investigators in Poultry Husbandry.

FOR the last five years experimental work has been carried on at the Storrs Agricultural Experiment Station on the subject of incubator ventilation. The aim has been to approach this problem wholly from the biological standpoint and to determine, if possible, what effect carbon dioxide had upon the development and hatching of the chick.

Mr. H. D. Edmond, the chemist of the experiment station, has been associated with me in this work, and all credit for careful, painstaking work of taking tests for carbon dioxide and moisture together with the perfection of the apparatus should go to him.

Different types of apparatus were used until one was made in which eggs could be placed in an egg chamber made air tight except for an inlet pipe perforated at intervals through which the air was introduced near the top of the egg chamber, and an outlet system of pipes carried the air to one point near the bottom of the egg chamber. This egg chamber had a content of two cubic feet and

contained a circular tray holding seventy eggs so arranged that they could be turned from outside the egg chamber. This device made it possible to seal the incubators throughout the period of incubation, except for the time elapsed in testing the eggs on the seventh day and weighing them at that time and at the end of the second week and a short time before exclusion.

We were supplied with electric power to pump the air through meters at a uniform rate and pressure. The rate was first tested by running the air through an accurate meter. Afterward the rate was measured by gas meters, one for each egg chamber, which were read each day, and the total amount taken and the rate checked at intervals through the hatch by the more accurate meter. So by adjustment we could supply to each egg chamber any desired amount of ventilation from a fraction of a cubic foot to twenty-five cubic feet per hour for each hour of the hatch with but little variation. Before entering the egg chamber this air was introduced into a humidifier so arranged



A Red Sussex pullet. (See page 80).

[Copyright.]

with water and heat regulated by thermostat as to give a nearly uniform percentage of moisture. Two egg chambers were heated by the same incubator lamp, and but little trouble was experienced in the control of the temperature, though the incubators were under supervision throughout the working hours of the day, as the work of taking samples from these six egg chambers, together with commercial incubators and hens that were run in conjunction with the experiment, took one man's time from the beginning of the incubation in February until the middle of July. We were fortunate, too, in having a night watchman who visited the incubator room at intervals during the night to look at the lamps.

White Leghorn eggs were used for the greatest number of the tests. These were from strong, vigorous birds of the same flock and tested high in fertility. From five to seven hundred eggs were used in each hatch, and hatches were run as near together as we could get ready for them.

When the hens were used, different types of nests were made; also different types of nest boxes. Only the Prairie State and Cyphers incubators were tested, as time or space did not allow for more. These incubators were run according to the manufacturers' directions, with the possible exception that we did not always give as much time for cooling the eggs as was directed, but this cooling was by no means slighted, except in the case of the eggs used in our apparatus.

Samples of air were drawn each day with nearly a twenty-four hour interval, and tested by Peltenkeller's method of carbon dioxide determinations. Other methods were also compared with this, together with gravimetric samples for moisture which were taken at intervals throughout the hatch, with egg weights and chick weights, the details of which will be published in the near future.

The Bohr and Hassebalch investigations showed that the carbon dioxide elimination is very small in the first days of incubation, and after the ninth day augments the increase in the weight of the embryo. We were able to verify this and to make this increase rapid or slow according to the volume of air used per hour. This made it possible to study the effects of these amounts of carbon dioxide upon the developing embryo.

It was found that quantities of carbon dioxide exceeding five hundred parts of carbon dioxide had an exceedingly bad effect upon the percentage of the hatch, and that of the small percentage of chicks hatched, at least half that number were cripples, and those that were not crippled seemed to have used up the greatest part of their vitality, so that the death rate in brooding was very high. Evidently only the strongest embryos are able to withstand these large amounts of carbon dioxide, and death results from asphyxia. An incubator having but one-quarter cubic foot of fresh air per hour approximates the Black Hole of Calcutta.

It is doubtful if any embryo can withstand seven hundred parts of carbon dioxide in ten thousand. An incubator full of embryos would not be able to generate that amount, as their numbers would be reduced by death and the generating power reduced accordingly.

To go to the other extreme, good hatches were had when the carbon dioxide did not exceed thirty parts.

It is very difficult to reduce the amount below that figure without excessive evaporation to the eggs. In the tests with hens taken in the incubator room, the samples were increased by the carbon dioxide in the room which ranged from three to ten parts. The total amount under hen, however, ranged at the highest points from forty to sixty parts according to the type of nest.

Tests from the Prairie State and Cyphers incubators were very close to these figures, not exceeding sixty parts.

Where different amounts of ventilation were used in our incubators, varying from one-quarter of one cubic foot per hour to twenty-five cubic feet, it was found that five cubic feet per hour for an incubator chamber of two cubic feet contents, gave the best results and gave consistently good results. In sixteen hatches run with that amount of ventilation, seventy-eight per cent of the fertile eggs was the lowest per cent of hatch, and the total sixteen hatches averaged eighty-five per cent of the fertile eggs. In this the carbon dioxide reached from fifty to sixty parts in ten thousand and resembled very closely the amount found under the hen.

The difference between amounts of carbon dioxide ranging from thirty to two hundred parts of carbon dioxide seems to make but a small percentage difference in the hatch, and but little difference in the mortality through brooding. When the carbon dioxide exceeds three hundred and fifty parts at the highest point the percentage of hatches is very perceptibly reduced.

While chicks then are able to withstand a considerable latitude of carbon dioxide just as they are able to withstand latitudes of temperature and moisture, it has been found that there is an amount of ventilation that gives consistent good results. Hens and commercial incubators are so close together that the fault of artificial incubation cannot be said to lay at the door of either too much or too little carbon dioxide.

Late Moulting and Egg Production.

From a bulletin by Prof. James E. Rice, recently published by Cornell University, we cull the following: "The highest producers moult late. The first physical character and the most valuable of all in selecting hens for breeders that are high producers, is lateness in moulting. The hen that is born to lay a large number of eggs, and is well fed and handled, will generally follow the line of least resistance and continue to lay, and thus fail to perform the natural process of moulting. This is because she has so much reserve power that she continues to lay, and as a result her feathers do not die and loosen."

POULTRY COOKERY.

CONVENIENT BREAKFAST DISHES.

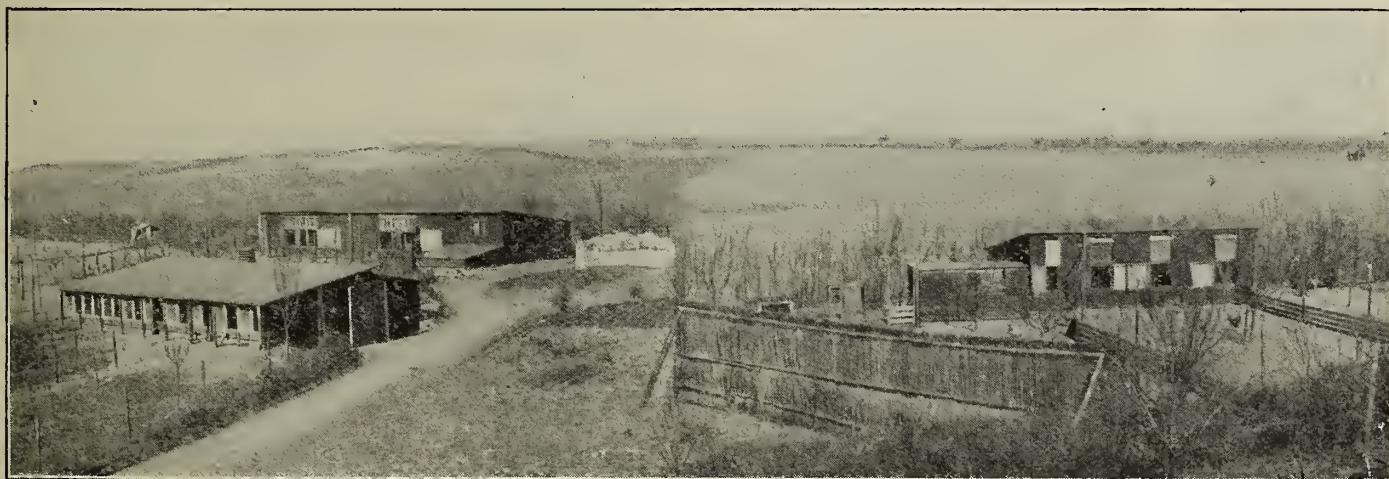
During the somewhat dark gloomy mornings of autumn and winter the breakfast table requires decidedly more attention on the part of the housewife than during the summer time, and she will be wise to provide, as far as her means permit, dishes of a very tempting appetising kind. This may seem at first sight a rather difficult task, but it is not really so, as just by the exercise of a little forethought this catering can be quite easily accomplished, there being so many suitable and inexpensive dishes which can be made ready the previous night. Take for example the following:—

CHICKEN ROLLS: Carefully remove all bones, skin, gristle, etc., from the remains of cooked chicken and chop the meat very finely, then put it in a mortar with half its weight in lean cooked ham or bacon, and quarter its weight in fine white bread crumbs, and pound until the mixture is perfectly smooth, adding during the process, a

press gently but firmly so as to make the slices adhere, then cut it right through in quarters, and serve as suggested for "Chicken Rolls."

SCRAMBLED CHICKEN: Free the flesh from all skin, gristle, etc., and tear it into fine shreds about an inch long, or, if preferred, cut it up into small dice; season these pleasantly and set them in a cool place until required. Next morning break three or four fresh eggs into a stewpan, add an ounce of butter and three or four tablespoonfuls of milk, and stir over a moderate heat until well mixed, then add the seasoned chicken and continue to stir briskly until thoroughly hot, using a large strong fork for the purpose. When ready, pile up the preparation in the centre of a very hot dish, and sprinkle the surface with a little finely minced hot parsley; garnish round about with finger pieces of hot crisp toast and sprigs of parsley, and serve as quickly as possible. If liked, a small quantity of cooked lean ham cut up in the same way as the chicken may be added to the above.

CHICKEN SCALLOPS: Mince the remains of cooked



On a Danish breeding centre for barred Plymouth Rocks.

[Copyright.]

liberal seasoning of salt, pepper, and grated nutmeg, a small quantity of fresh butter and a sprinkling of finely chopped parsley. When ready, make up the preparation into neatly-shaped rolls about three inches long, and after coating these in the usual way with a firm smooth covering of beaten egg and fine bread crumbs, fry them in boiling clarified fat until quite hot through and well-browned, then drain thoroughly, arrange on a hot dish paper, garnish with parsley, and serve.

SAVOURY TOASTS: Prepare, pound, and season the meat as already directed, then when required put it into a stewpan, add a small quantity of strained lemon juice, and heat very slowly but thoroughly. Toast three or four slices of stale bread cut about half an inch thick, and when done cut off the crusts making the slices quite even in size and shape; butter these well with fresh butter and place them together with a layer of the prepared chicken between, thus forming a nice high pile;

chicken very finely with one third its weight in boiled ham or very prime bacon, add seasonings according to taste, moisten with a small quantity of sauce, if any is left over, or with a little white stock or milk just slightly thickened with flour, and cover over in a cool place over night. Next morning take the requisite number of scallop shells made of fire-proof china, which have been well buttered and sprinkled with fine bread crumbs, and fill these with the prepared chicken; sprinkle more breadcrumbs on the tops and moisten these with a few drops of liquid butter, then bake in a brisk oven until nicely browned and quite bubbling hot. Ornament the scallops with a little finely minced hot parsley mixed with sifted egg yolk, arrange them in neat order on a hot dish covered with a folded napkin, garnish with sprigs of parsley, and send to table very hot.

FRIED CHICKEN (A French Method): Cut up the cold chicken as neatly as possible into small

slices or pieces, and dip these into beaten egg first then into fine bread crumbs which have been seasoned with salt, pepper, and nutmeg, and mixed with a small quantity of grated cheese; press the covering in firmly, and repeat the process a second time so as to render the coating quite thick and smooth, then set in a cool place over night. When required, fry the chicken in boiling clarified fat until daintily browned, then drain thoroughly and dish up neatly on a hot dish; garnish round about with tiny rolls of carefully fried bacon and sprigs of pleasantly seasoned watercress, and serve at once. If a still more appetising dish is preferred, the fried chicken may be served on a puree of mushrooms or tomatoes. If the puree is made ready the previous night a very few minutes will suffice for re-heating in the morning.

TABLE POULTRY AT THE DAIRY SHOW.

Taken as a whole, the show of dead poultry at this season's Dairy Show was distinctly better than in previous years. We are sorry, however, to see that the awards are given to the grosser specimens rather than to the smaller and those of finer quality. The enormous birds that have won in some classes are not really a marketable commodity and therefore we would have preferred to have seen some of the prize money going to those which would realise higher prices when sent to Leadenhall or any local market.

The outstanding feature of the show was the success of Her Grace, the Marchioness of Londonderry. It will be remembered that last year her birds secured the gold and silver medals in two classes, and again this year she has been awarded first prize, gold and two silver medals, and second prize in class 7 for a couple of cockerels—Indian Game-Dorking cross—while in class 8 for a couple of pullets of a similar cross she has secured first prize and silver medal. Praise is richly deserved by Mr. Mothersele, the well-known fatterer for the perfect condition in which these birds were staged.

In the Orpington classes the first and second prizes went to very good examples of well fattened White Orpingtons, and the third prize was awarded to a pair of Buff Orpingtons shown by Mr. H. J. Tennant, M.P. In our opinion the quality of flesh was better in the third prize fowls than in either the first or second winners.

In the class for Orpington pullets the first prize was won by Messrs. Chivers & Sons, Lord Rothschild taking second place. Pen No. 19 shown by Mrs. Furney were by far the best in the class, but they were too late for the judging.

To indicate the present craze for size and grossness we regard the second prize birds in the Any Other Variety class pullets as superior to the winners shown by Mr. Tennant, and also in the Any Other Cross class. For a couple of pullets we

believe that the second and third prize winners were in much better condition than those which took premier place, shown by Lord Rothschild.

The best birds in the show appeared in class 14 for a Couple of Pullets, Pure or Cross Bred, fed under natural conditions. These were shown by Mrs. S. Hayward and received the first prize and the bronze medal.

Seeing that the market value is the most important point in connexion with table poultry we were glad to see so many pens staged by farmers or cottagers and to see them in such first class condition.

PRESERVED EGGS.

Not a Food but a Condiment.

"La Nature," a French periodical, prints an interesting article about a new method of preserving eggs. It states that the Indo-Chinese have such a good method of preserving the eggs of their hens without any special precautions or cold storage packing that they do not deteriorate during long voyages. This result is obtained by covering the eggs with a layer of paste made with water, sea salt, and vegetable ashes. The eggs are covered over regularly with a layer of half a centimetre or a centimetre thick, and are then put to dry. Certain saline efflorescences are formed which give them the aspect of snowballs. After having been completely dried the eggs are simply piled up in a dry place, and they will keep in good condition from one year to another. When they are to be used the "balls" are placed in water. The saline covering is melted and the egg is ready to be consumed. But owing to certain osmotic exchanges which take place through the porous covering formed by the shell the eggs thus preserved are extremely salt. Not only is the sea salt diffused in them, but the alkaline carbonates contained in the vegetable cinders also add to its action. It is, in fact, this which ensures the preservation of the eggs for such a long time; and it is indispensable, as is done by the Annamites, to use the eggs thus preserved as a kind of condiment which, when mixed with a large proportion of rice, serves both as a sauce and seasoning.

Keeping out the Fowl Tick.

The Federal Government of Australia has issued a proclamation prohibiting the importation into the Northern Territory of fowls from Asia and the East Indies, owing to the danger of introducing the fowl tick and other pests or diseases.

A Canadian Order.

As we are going to press we learn from Mr. W. Tamlin, of 40, St. Margarets Works, Twickenham, that he has just received from his agent in Canada an order from the Canadian Government for ten 200-egg Tamlin incubators for use in their different experimental colleges throughout Canada.

PAST AND PRESENT AT THE DAIRY SHOW.

By PROFESSOR LONG.

THERE are probably very few who are able to compare the birds at the Dairy Show of 1913 with those which were exhibited thirty-five years ago—of course I speak of mental comparison. Having been a member of the original committee, and having both exhibited and judged at some of the early meetings, I am able to recollect how unmistakably different was the “then” as compared with the “now.” At the recent show there were 115 classes for birds of varieties which in the earlier days were non-existent. Surely there are no breeders in the world so ingenious as the British. In the production of all pure races of domestic live stock we excel—so much so indeed that in the case of the stock of the farm—there are no pigs and only one variety of sheep in Europe or America which, if worthy of the name of a breed, are not the result of employing British stock. Still more remarkable is the poultry-yard, but here we have sacrificed utility to fancy, and although our pure varieties, by which name we must denominate modern productions, are more numerous and more perfect than those of our neighbours, we have not yet obtained the lead for utility poultry.

The great breeds of the past, under present conditions indicate how fragile are our tastes. The Brahmas and Cochins—so long the commanding classes—have in spite of their distinct and undying individuality, been compressed into a section smaller than is devoted to the Sussex, the Orpington, or the Rock—all modern creations—and neither comparable, if blood is to tell, with those almost moribund breeds. The first, an improved barn-door, useful perhaps, but a barn-door all the same—the second, just a self-coloured hen of no type when estimated as a pure variety, and the Rock a Yankee creation which I first imported myself. It is quite fair to believe that the influence of the modern poultry show—the table classes apart—is of greater utilitarian value than that of the shows of the now distant past. Brahmas, Cochins, Spanish—now quite defunct—Polish, Hamburgs, Minorcas, Andalusians, Leghorns and Malays had no merits on the table, while the majority of these breeds were equally deficient as layers and they are in most cases passing in con-

sequence. As meritorious utility fowls they do not compare with the Wyandotte, but when looked at from another point of view, and that is the point on which poultry shows have been built, the majority of the modern breeds are but plebeians in patrician company, a democracy as compared with an aristocracy. The Flèche and the Crèvecoeur have gone, but they are more beautiful as productions of the breeder's art than their successors, the Bresse and the Campines which I remember at the great Paris exhibitions of 1878 and 1889 were positive mongrels. The majestic Cochin of old days, of a gorgeous lemon buff, was, perhaps less useful than the buff Orpington or the buff Rock, two birds with some distinction but very



Mr. W. Cook and his daylight-saving scheme.

By courtesy of The Sketch.

Mr. W. Cook, the well-known poultry-breeder, of Orpington, has thought of a plan to lengthen the working day of the hen, in order to induce her to increase the population to a greater extent. His method is to illuminate the hen coops with electric light after dark. The system was on view at the Ideal Home Exhibition at Olympia, where an ordinary coop, in which the inmates went to roost at sundown, and another lit by electric light, were placed side by side. It is claimed that the hens in the latter are more prolific.

little difference. The delicately pencilled Brahma was equally the blood superior of the Sussex, and the modern Game of the Old English. The Hamburgs, most artistic, both in colour and marking, of all British poultry, has yet no rival in the field, its graceful form and carriage alone making it a distinguished specimen.

It is curious to notice that in this practical age, the age of table poultry classes and laying competitions, the Dorking is so little considered. It is approached as a table fowl by no breed of poultry in the world, whether on account of its size, the proportion of flesh on the best parts of the carcase, or the quality of its meat, yet at the Dairy Show the prize money offered amounts to £15 against £28 for the Sussex and £55 for the Orpingtons, two varieties which are not fit to black its boots. Fanciers, however, always will be fanciers, and they rule. What they are willing to pay for, show committees are willing to supply, and it matters little whether the exhibit is one of utility. Rhode Island Reds are now on equal terms with the Dorking, and like the Faverolles and the Ancona, and various sub-varieties of Wyandotte, Plymouth Rock, and Leghorn, they are but the media through which our British taste for sport is gratified. With the production of Bantams of these varieties there will not be many more world's to conquer, unless some genius arrives who will show us the way.

In the department next door to the poultry at the Agricultural Hall, something in this direction may be gleaned. Breeders of cows no longer make colour, the form of the horn, and the shape of the udder a *sine qua non*, they are breeding for milk. Will the time ever come when the poultry fancier will cast feather and marking to the wind and make utility king. The Dairy Show is utilitarian, it has an object, but that object is not to offer prizes for fowls which have no more economical value than parrots, which, if not useful, are at least amusing to man.

After all, I honestly think that some progress has been made, in spite of the multiplication of breeds which indicates the line upon which the average fancier works. It is refreshing to find that there is no subdivision in the Indian Game and the Malay, the Andalusian, or the Minorca, although in the past there were excellent whites. Among the most grievous departures from earlier programmes in relation to the more beautiful breeds is the total abandonment of the classes for gold and silver pencilled and spangled Hamburgs, the extinction of the Red-cap, and the diminution of the Polish classes which have always had admirers among the sight-seeing public. So long as there are fancy poultry it is surprising that fanciers should place many of the modern sub-varieties before the silver and gold, white crested, black and chamois Polish, all once so magnificent. Nor can we imagine why the Flèche, strikingly handsome as it is, or the Crève once so magnificently shown by Mr. Wood,

of Uttoxeter, should be deposited by other continental breeds which came to us in second-hand clothes and with no standard of colour or marking until Englishmen made it.

What has happened among poultry has also happened among ducks, if to a smaller extent. The exquisite Mandarins and Carolinas are extinguished by such manufactures as Indian Runners and Orpingtons, which have as much relation to them as a house painter has to an artist in oils. Where will these concoctions end? The Pekin was a most valuable addition to our waterfowl, and happily it has not been bred in buff and blue.

One of the most surprising departments of the modern show of the calibre of the Dairy Show is that conceded to Bantams, which are acknowledged hobbies of so many who have nothing to do. At the earlier shows these sweet little birds were confined to the black and brown red, Pile and duckwing game of modern type, the black and white rose-combed, the silver and gold Sebright, and the Pekin, with an occasional pen of Booted, Nankin, or Japanese. But there has been an expansion, the modern game are supplemented by the Old English and the Malays, the Pekins and other varieties by Scotch Greys, Brahmas, Polish, Wyandottes, Yokohamas, and Indian Game, and still they come. The late Mr. Entwisle was the architect of the modern Bantam, but he probably never dreamed of the far-reaching character of his work. I believe that his first attempt outside of the game varieties was with the Brahma, for which I sent him a diminutive specimen. Some day, perhaps, bantam men will design a show of their own, and who shall say that they will not carry their art still further and produce bantam Bantams.

WAR AGAINST FIELD RATS IN THE AUSTRIAN TYROL.

Kaltern, near Bozen, in the Austrian Tyrol, a village credited with producing the finest grapes and the best Tyrolean wine, has recently shared the fate of other districts of a less elevated situation (Kaltern itself lies over 1,000 feet above sea level) in suffering from an invasion of field rats. The burghers, growing alarmed, called to their aid the modern Pied Piper of Hamlyn, Dr. Danysz, of the Pasteur Institute, Paris, whose beneficent work has frequently saved French agriculturists in similar circumstances from serious loss. At all events, during the last week or so, several tons of crushed oats have been impregnated with Danysz Virus, and the bait distributed over the infested fields and vineyards, in the manner suggested in the interesting picture which we reproduce on page 91. The operations have proved remarkably successful, and great relief is felt that the harvest and vintage have been saved from the havoc with which they were threatened.

TRADE EXHIBITS AT THE DAIRY SHOW.

Poultry appliances of the present day are nearing perfection and therefore one cannot expect to see much in the way of great improvements whether in incubators, houses, brooders, or the smaller appliances. The inventive capacity of some manufacturers is so great, however, that even this year there are a few improvements which will undoubtedly make for the betterment of the utility poultry industry in all its branches. A great feature of the show was the various houses adapted to the requirements of intensive poultry keepers. This system has been advocated by a large number of the more progressive poultry keepers during the past two or three years, and from the evidence heard there is undoubtedly a future for this method of poultry-keeping. Manufacturers are never behind the times, and so a number of them are showing first class houses specially designed for this purpose. Unfortunately space does

experiments go to indicate that mustard is one of the finest of the many egg producing tonics, one can hardly be surprised that it is almost impossible to get a word in edgeways with this genial representative of poultry foods and medicine makers, owing to the number of his visitors. This display of foods was very good indeed and we are glad to learn that sales are always increasing in number and in value.

Armitage Bros., Ltd. Among the many other feeding stuffs shown by this firm was the "Mor-egs" laying meal. This is a new mixture, and by its analysis one would conclude that it will be a very successful egg producer in the future. A display of mustard for poultry in various sized tins adds to the attractiveness of this stand.

Craven's Patent, Ltd., Manchester. This firm staged a full and comprehensive line of poultry and pigeon hampers of all kinds of sundries relating to poultry-keeping. This firm has won its way to the front



Laying Danysz Virus bait at the edge of a rat-infested vineyard at the Austrian Tyrol.

(see preceding page).

not permit of giving a complete description of the numerous exhibits shown by the various makers, therefore we shall have to content ourselves by giving a short summary of the principal features of the stands.

Abbot Bros, Thuxton, Norfolk. A very fine display was staged by this firm, including all kinds of small appliances for poultry keeping. The Spike Poultry Fountain is one of the cheapest on the market and is also one of the best. It is practically undamagable and will stand rough usage and will last a lifetime. The series of models of poultry houses that were shown by this well-known firm were not only good as models, but they had been designed with a view to giving a maximum of fresh air, and in this way to keep the birds healthy.

The Allen Poultry Co., Ltd. As the introducer of mustard as a tonic and invigorator for poultry, one expected to find this substance in evidence on Mr. Allen's stand. The colour scheme of yellow and black was distinctly attractive, and when one remembers that recent

not only by the quality of its goods but also by the promptitude with which all orders are fulfilled.

Cypher's Incubators Co., Finsbury Pavement, London. There was a very fine display of all kinds of appliances and food stuffs exhibited by this firm of world wide reputation. Their models are fitted with all the latest and most up-to-date improvements which are not only specialities for this country, but are adapted for use in all countries and all climates. As introducers of the celebrated Alfalfa Meal, they make a special display of this material together with various poultry meals, etc. Their specialities are so well known that it is unnecessary for us to refer to them in details.

W. H. Cook, Orpington & Le Touquet. This stand was well worth a visit, not only on account of the photographs, medicines, etc., that were staged, but because of the information which it is always possible to pick up from Mr. Cook. No question is too simple and we might also say too difficult for Mr. Cook, and everyone

is certain of receiving exactly that for which they came. We have referred before in these columns to the fact that Mr. Cook has started a poultry farm in France, and we were glad to hear last week that it is proving a very successful venture, and that he has very great hopes for the possibilities of the undertaking, not only as a money making concern, but also as an influence on the poultry industry of France.

W. Cook & Sons, Orpington House, St. Mary Cray, Kent. The display of this firm was attractively set off with a large number of fine photographs depicting the pens and birds at their well-known farm. Samples of foods, grits and medicines take up the greater proportion of the room, and this is justified by the very great demand which is experienced for the various commodities which are sold. One expects to find Messrs. Cook & Sons in the same position every year, and it would be a very great disappointment to many if this stand was removed to any other part of the gallery.

The Dairy Outfit Co., Ltd., King's Cross, London, N. In addition to their well-known egg boxes, such as the "Standard," the "Pocock," and "Cushion," this firm has introduced a new regulator in their incubator. This is an electric attachment consisting of a bell and battery which gives warning to the operator if the temperature of the machine becomes too hot or falls too low. This device can be regulated and set to any degree that is considered necessary by the worker.

Dixon's Poultry Hospital, Birmingham. A very fine exhibit of poultry remedies was staged by this well-known firm. The R.P. is well to the fore and recent testimonials go to show that this is one of the best preventive powders that is on the market.

G. Dent, Ltd., Oadby, Leicester. Amongst others, two interesting exhibits were shown by this firm, namely, an oat sprouter and a green food chopper. These are both handy appliances and are sold at a remarkably low price. A great point made by "Intensivists" is feeding on green food and this is one of the best oat sprouters that we have seen.

A. W. Gamage, Ltd., Holborn, E.C. This firm of universal providers had a very good show of their "Holborn" Incubators and brooders together with several smaller though equally useful and necessary appliances.

Gloucester Incubator Co., Gloucester. The show of incubators and other appliances made by this firm is very good indeed. The Gloucester Incubator is self-ventilating and regulating, and has been on the market for some years and it has secured for itself a foremost position as a successful hatcher of fertile eggs. The self turning egg tray is a masterpiece of ingenuity and it takes away the most tedious part of the necessary attention to the incubator, and moreover ensures the work being done properly. There is no possibility of jarring the eggs as the movement is made without the slightest effort and every egg is turned in the tray. An improved lamp is also fitted with an oil reservoir holding sufficient oil for the whole hatch. This type of lamp has certain advantages over the self-filling and can be relied upon to work with precision. An automatic door closing appliance is also fitted, this working in such a way that the door is closed at the end of the appointed cooling period. These may appear to be small points but inasmuch as they make for the more successful hatching operations they are to be welcomed.

J. T. Hobson, Bedford. There was a good display of poultry houses, coops and runs shown by this old established firm. The Champion house and run measuring 12ft. by 4ft. is a marvel at the small cost at which it is sold.

Harry Hebditch, Martock, Somersetshire. This name attached to any appliance is a guarantee of quality and workmanship, and this is undoubtedly proved by the very rapid growth of Mr. Hebditch's business during recent years. The incubator and foster-mother are both durable and cheap and have won high praise from all users.

"Lasco," Ltd., Carruthers Street, Liverpool. Fortunately for the poultry-keeping public this firm's exhibit was staged in a more convenient spot than was the case twelve months ago, and, therefore, as one would expect the stand was surrounded by a number of interested spectators all wishing to find out the special qualities of their wonderful egg producing food. When one is informed that it is impossible to grumble at the rate at which the sales are increasing, it is easy to form the opinion that this firm is going ahead as they so richly deserve. Mention must be made of the Lasco £100 egg laying competition to be held at the Liverpool Show on November 4th and 5th. The promoters guarantee that everyone has an equal chance, from the back-yarder to the scientific poultry-farmer, and this feature is worthy the attention of all poultry keepers.

Liverine Ltd., Grimsby. This firm had a fine display of foods and medicines including their latest production of "The Water Rat" Roup cure. This is the outcome of many year's experimenting and numerous poultry-keepers who have already tried it speak very favourably for the results that have accrued. A special feature is being made this year of their clover meal and the samples shown suggest that only the finest quality material is used in its manufacture.

Finch & Fleming, Ltd., Flintwick, Beds. The American Automatic Feeder for which this firm holds the sole manufacturing rights for the Eastern Hemisphere was again on view. This is a very simple contrivance, but it is practical and an economical labour saving device. It is made in various sizes, one of the best having a capacity for sufficient grain for thirty birds for a week. The gate catch also shown by Finch & Fleming is a good idea and will be found very useful by the practical man when his hands are full carrying food and water supplies.

James Marshall, 12, Regent Quay, Aberdeen. There is no manufacturer of egg boxes who has a larger sale for his goods across the border than Mr. Marshall. Not content with the various forms of boxes that he has had upon the market for some time he has now produced others which not only embody the old features, but also a few improvements. The ideals for an egg box are lightness, safety in transit and cheapness. The ventilated crate to hold thirty dozen eggs weighing as it does only seventeen pounds, fitted with patent fasteners is one of the best boxes that we have seen. The single journey crate to hold the same number weighing only fourteen pounds fitted with the best cardboard sections and selling at a very reasonable price is a most useful appliance for long distance and export work. We hear that the special simplex three-dozen size fitted with Hurculean filler is having an ever increasing sale. Special boxes are made by this firm for hatching eggs and day-old chicks.

Randolph Meech, Poole, Dorset. As one would expect, since Mr. Meech was the pioneer of the intensive system in Great Britain, he again made a special feature of this new system of poultry keeping at his usual stand in the gallery. The whole display of houses, fireless brooders, coops, and double-decker houses, attracted a very large number of visitors during the entire day. Mr. Meech's new catalogue gives full and comprehensive details of the various appliances made at his works at Poole, and we would advise all breeders to secure a copy as soon as possible.

TABLE OF PRICES REALISED FOR HOME, COLONIAL, AND FOREIGN POULTRY, GAME, AND EGGS FOR THE FOUR WEEKS ENDING OCTOBER 18th, 1913.

ENGLISH POULTRY—LONDON MARKETS.					FOREIGN POULTRY—LONDON MARKETS.					
DESCRIPTION.	1st Week.	2nd Week.	3rd Week.	4th Week.	COUNTRIES OF ORIGIN.	CHICKENS. Each.	DUCKS. Each.	DUCKINGS. Each.	GESE. Per lb.	TURKEYS. Per lb.
	Each.	Each.	Each.	Each.						
Surrey Chickens ...	3/0 to 3/6	2/9 to 4/0	2/9 to 4/0	2/9 to 4/0	Russia	9 to 10	—	—	—	—
Sussex	3/0 " 3/6	2/9 " 4/0	2/9 " 4/0	2/9 " 4/0	Belgium	—	—	—	—	—
Boston	1/9 " 3/0	2/0 " 3/0	1/9 " 3/3	1/9 " 3/0	France.....	—	—	—	—	—
Essex	2/0 " 3/3	2/0 " 3/3	2/0 " 3/6	2/0 " 3/6	United States of America lb.	9	—	—	—	—
Capons	4/0 " 5/0	4/6 " 5/6	4/6 " 5/6	4/6 " 7/0	Austria	—	—	—	—	—
Irish Chickens	1/6 " 2/6	1/9 " 2/9	1/9 " 3/0	1/9 " 3/0	Canada	—	—	—	—	—
Live Hens.....	1/3 " 2/6	1/6 " 2/6	1/6 " 2/6	1/6 " 2/6	Australia.....	—	—	—	—	—
Aylesbury Ducklings	2/0 " 3/0	2/0 " 3/0	2/3 " 3/3	2/3 " 3/3						
Ducks	—	—	—	—						
Goslings	5/0 " 7/0	5/0 " 7/0	5/3 " 7/0	5/0 " 7/0						
Turkeys, English, lb.	—	—	9 " 1/0	9 " 1/0						
Guinea Fowls	—	—	—	—						

ENGLISH GAME—LONDON MARKETS.				
DESCRIPTION.	Each.	Each.	Each.	Each.
	Each.	Each.	Each.	Each.
Grouse	3/6 " 4/0	3/6 " 4/6	3/6 " 4/0	3/0 " 3/6
Partridges	1/9 " 2/3	1/6 " 2/0	1/6 " 2/0	1/9 " 2/3
Pheasants	—	2/6 " 3/6	3/0 " 4/0	3/0 " 4/0
Black Game.....	—	—	—	—
Hares.....	2/9 " 3/3	2/6 " 3/0	2/6 " 3/0	2/6 " 2/9
Rabbits, Tame.....	1/0 " 1/6	1/0 " 1/6	1/0 " 1/9	1/0 " 1/9
" Wild	9 " 1/0	8 " 1/0	9 " 1/0	9 " 1/0
Pigeons, Tame.....	—	—	—	—
" Wild	—	—	—	—
Wild Duck	1/9 " 2/0	1/6 " 1/9	1/9 " 2/0	1/9 " 2/0
Ptarmigan	1/2	1/2	1/2	1/2
Hazel Hens	1/1	1/1	1/1	1/1
Plover	—	—	6 " 9	6 " 8

ENGLISH EGGS (Guaranteed New-Laid).				
MARKETS.	Per 120.	Per 120.	Per 120.	Per 120.
	Eggs per dozen.	Eggs per dozen.	Eggs per dozen.	Eggs per dozen.
LONDON	11/- to 13/6	11/- to 13/6	11/- to 13/6	11/- to 13/6
Provinces.	—	—	—	—
CARLISLE.....	1/4	1/4	1/4	1/4
BRISTOL.....	1/3	1/3	1/3	1/2

IMPORTS OF DEAD POULTRY & GAME. MONTH ENDING SEPTEMBER 30TH, 1913.				
COUNTRIES OF ORIGIN.	Price Each During Month.	DECLARED VALUES.		
		Poultry.	Game.	
Capercailzie	—	£370	—	
Black Game	1 1/2	£1,511	£46	
Ptarmigan	—	—	—	
Partridges	—	—	—	
Quail	10 to 1 1/4	—	—	
Bordeaux Pigeons	—	£15,275	£4,335	
Hares	—	—	—	
Rabbits	—	—	—	
Snipe	—	£17,156	£4,381	
Totals.....	—	—	—	

IMPORTS OF EGGS. MONTH ENDING SEPT. 30, 1913.				
COUNTRIES OF ORIGIN.	Quantities in Gt. Hand.	Declared Values.		
		Declared Values.	Declared Values.	
Russia	1,298,520	£541,777	£541,777	
Denmark	412,854	£219,292	£219,292	
Germany	8,697	£3,655	£3,655	
Netherlands ...	78,977	£41,300	£41,300	
France	56,558	£27,071	£27,071	
Italy.....	44,256	£21,438	£21,438	
Aust.-Hungary	43,771	£19,226	£19,226	
Other countries	86,888	£36,798	£36,798	
Totals	2,030,521	£910,557	£910,557	

Morland Appliance, Co., Crawley, Sussex. There were two special features shown by this firm, both of which were of practical value to every poultry keeper. The first was a remarkable form of trap nest and it is constructed in such a way that there is no possibility either of the mechanism getting out of order, or the birds jibbing at an entry. It is sold at a reasonable price, and seeing the trap nest is of such value when the records obtained are utilised in the proper manner, we anticipate a large sale for this special form. The second feature of this stand was the double brooder that was being shown for the second year. It is the only appliance of this form on the market in which it is possible to have a different temperature in the two sections. The whole machine is very get-at-able, and the roosting chambers are well ventilated and fume proof. An intensive house was also being shown by this up-to-date firm, and in all details it is remarkably good.

R. Miller, Stirlingshire Poultry Farm, Denny, N.B. As one would expect, Mr. Denny is keeping pace with the times, and he has given his attention recently to one of the latest suggested methods of rearing, namely, by means of a fireless brooder. This is specially constructed so that the inmates are well protected against the rain and the wind. Coming from the North, the experience gained by Mr. Miller of the vagaries of the weather has stood him in good stead in thinking out the design for this machine. Another feature of this stand is the "Small-holder" brooder, heated by the direct rays of a lamp in the warming compartment. This is made in two sizes and so constructed that it is easy to clean and easy to move on to fresh ground. The patent hot-air incubator shown by this firm is fitted with a new moisture device in the form of a narrow water tray above the upper diaphragm. This is the only real way of increasing the humidity of the air in the egg tray, and one is not surprised that very good results indeed have followed the use of this machine.

Phosto Co., Emsworth, Hants. For the production of large-framed, white fleshed birds, there is no doubt that "Phosto" is one of the very best materials that is on the market. It is also excellent for getting birds into show condition, and it is unrivalled for producing strong germs in fertile eggs, and also for increasing egg production.

A. E. W. Phipps, Harborne, Birmingham. The hot-air and tank incubators of this firm are so well known that there is no necessity for us to introduce them to our readers. From the point of view of Mr. Phipps, the two main points with poultry appliances are the way in which they are constructed, and the results which follow the efforts of those who use them. Whether it is with the incubators, fireless brooders, or the three compartment rearer, Mr. Phipps has been successful in realising his ideals in this direction.

Robinsons' Patent Ltd., 332, Goswell Road, E.C. This firm produces boxes for the conveyance of eggs, poultry, and such like, and have an increasing demand. The special feature of this exhibit however, was the "Heureka" bone cutter. This is a German invention and this firm acts as agents in this country. Unlike the majority of appliances for this purpose it is not only simple to work but there is not the excessive labour which one finds with many other forms of this kind of appliance.

W. F. Snell, Yeovil. Some very useful appliances were shown on this stand, and the one that particularly took our eye was the cheap form of rearer which has been so extensively sold by Mr. Snell. This can easily be converted into a cold rearer when the occasion arises, and as one half of the run compartment is covered it gives ample protection for the birds from the time they are hatched. The ground food, water, and grit

rack, the trap nest, the metal fountain, and the "easy cleaner" floor are all worthy of attention, but this will have to be left to a future occasion.

Spratts Patent, Ltd., 24, Fenchurch Street, E.C. As usual this firm had a comprehensive display of foods, medicines, and appliances. These are so well-known that it is unnecessary for us to refer to them in detail. The Hearson Incubators, brooders, and crammers are world famous, and still hold a premier place as has been the case for so many years past.

M. Stanton, Brentford, Middlesex. This firm showed an improved incubator and rearer combined, of a make which is very simple, but which gives reliable results. It is made in the small size as well as a large and the price compares very favourably with other makes. The method of ventilation is very good, and it is impossible for any fumes to find their way into the egg chamber.

Horace W. Stevens, Linden Road, Gloucester. A new egg-turning tray is now fitted to the incubators made by this well-known firm. It is a very simple contrivance, and one would imagine that the results would be excellent, not only as a time-saving machine but also inasmuch as it does not jar any of the eggs during the motion of turning. The moisture device fitted to the hot air incubator and the "Gravel Hill" brooder are both worthy of mention.

W. Tamlin, St. Margaret's, Twickenham. In addition to the well-known incubator and brooders manufactured by this well-known firm, two new types of houses were shown. These are specially designed for those who work along intensive lines in poultry keeping, and like all the appliances coming from this house, they are not only well but scientifically constructed. The two new houses are the "Uckfield" and the "Ashford," and they should find a ready sale amongst the advocates of this new system of poultry-keeping. One noticed a few slight improvements in the incubators and brooders making for more easy manipulation and for better results.

A. Thorpe & Sons, Rye, Sussex. The demand for this firm's goods continue to increase and very favourable results as to the value of their foods are being received every day. In addition to the ordinary samples of foods and medicines, a special display of their "Cock o' the Walk" meal was made. This food is reckoned as a marvel for increasing egg production, and this statement is justified by the ever-increasing demand.

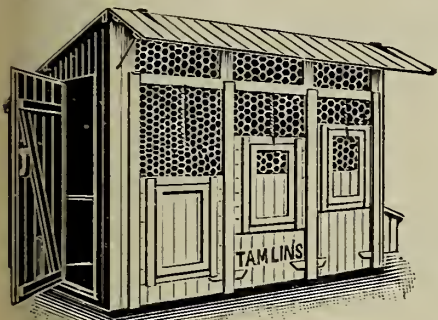
Messrs. R. Toope & Co.'s Exportations.

Among this firm's recent shipments have been a 4,000 mammoth incubator to New Zealand, an 1,800 machine to Rhodesia, and a 4,000 machine to Sweden; while enquiries are coming for them from all parts of the world. Other exportations have been two 100 and two 60 asbestic hen incubators to Nairobi; six 100, two 300, four 60, and two 36 incubators to Natal; twelve 100, four 200, and six 60 to Holland; ten 100 and twelve 60 to Belgium; four 100, six 60, and four 36, also six 100 chick brooders to Colombo, through Indian agent; four 100, four 60, and four 36 to Burmah, through same agent; twelve each of 100, 60, and 36, also six 100 chick and six 50 chick brooders to Western Australia; six 100, twelve 60, and six 36 to New Zealand agent, including twelve brooders of various sizes, grain and bone crushing machines, troughs and drinking founts; twenty-four 60, twelve 100, two 200, and twelve 36 sizes to Uganda and Rhodesia, through Rhodesian agent; six 60 and six 36 to Straits; ten 60, three 100, three 200, and twelve 36 to Cape; and twelve to Canada. The export trade is a large and a growing one.



"HARLINGTON"

POULTRY HOUSE & SCRATCHING SHED.



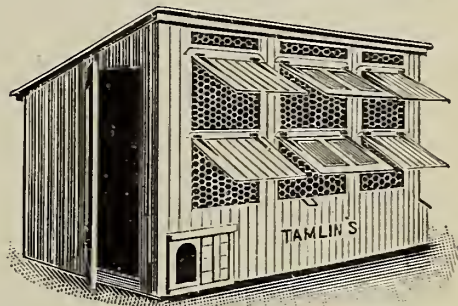
No 1. 6ft long, 5ft. wide, 5ft. 6in. high, £2/0/0
No 2. 8ft. long, 6ft. wide, 5ft. 6in. high, £2/17/6

"PETERSHAM" POULTRY HOUSE AND RUN.



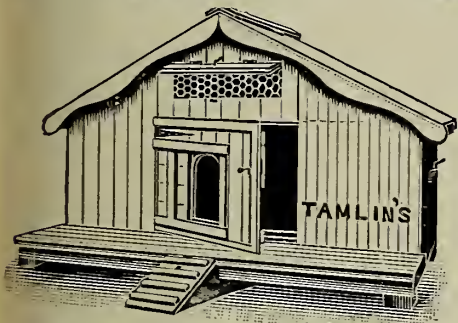
No. 1—House 6ft. long, 4ft. wide; Run 10ft. long, 4ft. wide, 4ft. high. Price, £2/16/6.
No. 2—House 7ft. 6in. long, 6ft. wide; Run, 12ft. long, 6ft. wide, 4ft. high, 4ft. high.
Price, £3/9/6 carriage paid.

"UCKFIELD" POULTRY HOUSE.



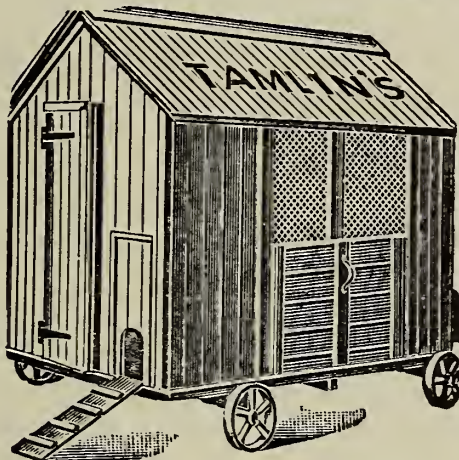
No. 1. 8ft. long, 5ft. wide, 5ft. high £2/10/6
No. 2. 10ft. long, 6ft. wide, 6ft. high £3/4/6
No. 3. 12ft. long, 7ft. wide, 6ft. high £4/7/6

"COLNBROOK" DUCK HOUSE



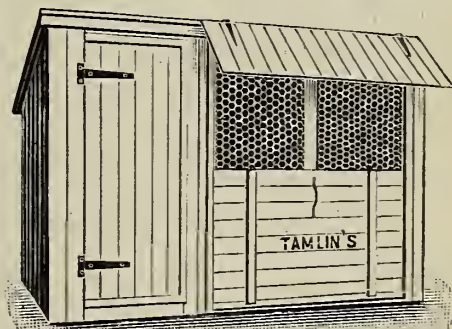
Mounted on raised platform.
6ft. long, 3ft. 6in. wide, 4ft. high.
Price, carriage paid, £1/10/0.

"SURBITON" POULTRY HOUSE.



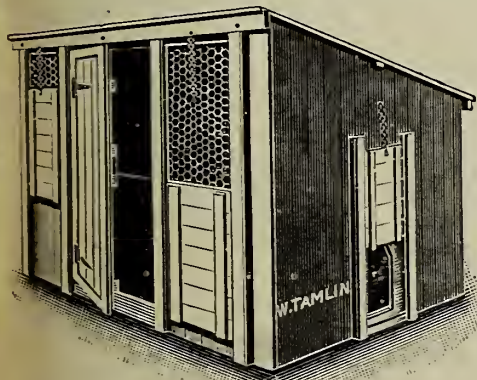
Long. Wide. High. Prices complete car. pd.
1. 6ft. ... 4ft. 6ft. 5in. 56/6 { without } 38/6
2. 7ft. 6in. 5ft. 6ft. 9in. 71/- { floor & } 49/6
3. 9ft. ... 6ft. 7ft. 0in. 86/6 { wheels } 65/-

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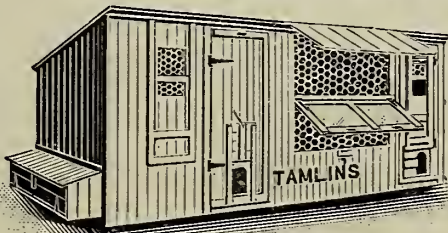
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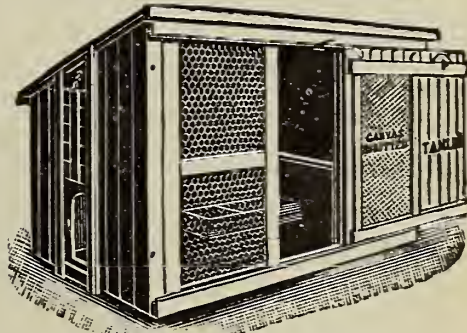
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Made in one size only, 5ft. 6in. long, 3ft. 6in. wide, 3ft. 6in. high. Price 17/6, carriage paid to any goods station in England and Wales.

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The Largest Incubator and Poultry Appliance Manufacturer in the World.

POULTRY KEEPING ON A SMALL HOLDING.

J. H. SCOTT.

THE holding includes about half an acre of grass land, which is divided into five equal parts, and is sheltered on the west by a wood, and on the south by a high hedge. The greater part is well shaded, making a favourable site for rearing chickens during the summer months; the soil is light, with chalky subsoil, not well drained, and very wet during the winter.

The object of the small holder was to find what results could be obtained by devoting a short time—say from one and a half to two and a half hours—per day to keeping poultry for utility purposes, mainly egg production.

The houses are of the open-fronted type, with shutters to draw up at night, and have scratching sheds adjoining, capable of accommodating up to twenty birds per house; floors are provided for both houses and shelters.

The stock at the outset numbered twenty-eight birds, composed of two breeding pens, Buff Orpington and Minorca, containing six pullets and one cockerel each, and fourteen cross-bred pullets which had been bred the previous year.

All hatching was done by pullets, and extended from the 16th April until the 26th June. During the season 104 chickens were reared to maturity, and of these only the cockerels were sold.

Feeding.—Feeding took place at regular times, and no waste occurred through food lying about on the ground. Chickens up to four months old were fed four times a day, and each alternate meal was of soft food. The adult stock received two meals daily during the summer months, and during the winter a midday feed was added. In severe weather the morning meal was given hot.

TRADING ACCOUNT.

Stock : 1st April, /12.	£ s. d. 3 7 6	Sales :	£ s. d.
Food	22 14 2	Eggs 26 5 9	
Extra Labour	12 0	Birds 6 18 0	
Carriage	1 9 10	Sittings 2 7 5	
Sundries	1 15 9		35 11 2
Balance	14 1 9	Stock : 31 March, /13.	8 9 10
	44 1 0		44 1 0

The food used was good sound grain, considerable quantities being purchased at a time. The following diet indicates the nature and amount of the foods purchased :—Wheat, 3,696 lb.; sharps, 1,526

lb.; maize, 406 lb.; meal, 224 lb.; chick seed, 182 lb.; bran, 126 lb.; meat meal, 70 lb.; barley, 56 lb.; oats, 42 lb.; biscuit meal, 42 lb.; flint grit, 224 lb.; shell grit, 224 lb.

RECORD OF THE NUMBER OF BIRDS IN STOCK AND EGGS LAID FOR EACH MONTH FROM APRIL, 1912, TO MARCH, 1913.

1912.	Cock- erels.	Pullets 1911 hatched.	Chick- ens.	Sales	No. of Eggs laid.
April	2	26	29	—	522
May	2	26	29 66	—	386
June	2	26	95 9	—	373
July	2	26	104 2	2	360
August... ..	2	26 3	102 24	27	324
September...	2	23	78 16	16	188
October ...	2	23	62 7	7	49
November ...	2	23	55 2	2	130
December ...	2	23 1912 hatched 53	53*	—	431
1913.					
January ...	2	76 9	—	9	700
February ...	2	67	9	—	791
March			7	—	1,247
	2	67	16		Average 45'4

* These were all pullets commencing to lay, so are transferred to previous column.

IMPORTANT TO ALL COLONIAL POULTRY KEEPERS.

At some time or other you will require a new Male Bird or some fresh Breeding Pens, but you may be in doubt as to parting with your money and then not receiving full value for same.

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Our Speciality and Principal Trade is to every part of the World, studying each Customer's Requirements in every detail, giving personal and prompt attention and undertaking full risk to any Port in the World.

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We supply the finest High-Class Breeding or Utility Stock, the best Exhibition Males or Females, all of which are well developed and hardy birds, and they all arrive in first class condition to the entire satisfaction of our hundreds of Clients all over the World.

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State the Breed, Variety, purpose required for and entrust us with your enquiry or order, when we GUARANTEE TO PLEASE YOU.

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No one abroad has ever complained or even grumbled at the selection made by William H. Cook, who is in the position of knowing almost every country and the class of birds required whilst he has been to and judged at most of the leading shows in England and abroad.

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Fanciers remember we have won over 5000 Cups and Prizes in the hottest competition everywhere.

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always
Welcome

Utility Breeders have won heaps of laying competitions with our pedigree layers in all parts.

DO NOT DELAY if you require one or 500 Birds, but send right away to HEADQUARTERS, where we keep thousands of the finest selection of every Breed of FOWLS, BANTAMS, DUCKS, GEESE and TURKEYS, to

WILLIAM H. COOK, Ltd.,

The Largest Poultry Breeders, Exhibitors,
and Exporters in the World.

ORPINGTON, Kent, England.

and at Le Touquet, Pas de Calais, FRANCE.

A plentiful supply of clean water was provided. As the birds had access to grass runs, no other green food was found necessary.

Sales.—All eggs were sold on the holding, thus saving any cost for carriage, but birds were marketed in the feather at the nearest town. Some twenty odd sittings of eggs were sold locally without advertising.

Sixty-three birds were sold during the year, leaving a balance of 69 birds at the end, to which must be added 16 chickens hatched in February and March.

The account on p. 96 shows a balance of £14 1s. 9d. towards the items of rent, interest, and depreciation, and to repay the small holder for his work.

Appliances and Cost.—The cost of appliances was as follows:—

	£	s.	d.
5 Houses ...	9	0	3
9 Coops ...	1	11	6
* Flooring ...	1	1	6
250 Stakes ...	1	16	5
9 Rolls Netting ...	4	11	0
6 Food Tins ...		7	6
12 Earthenware Pans ...		2	0
Sundries...	1	6	1
	£19	16	3

* Appliance makers charge somewhat heavily for floors, and it was found cheaper to buy three-quarter inch match boards for the purpose.

Capital.—The total amount of capital required to establish a poultry plant of this size is from £25 to £30. The whole of the appliances need not be purchased at the outset, but may be obtained gradually as the stock increases, but all will be required by the end of October; produce should be sold from the commencement of operations, and by the time the whole expenditure is needed, sufficient should have been realised to meet it.

Throughout the year the stock was entirely free from disease.

The late Professor A. G. Gilbert.

Canadian poultrymen in particular and the poultry industry as a whole have suffered a heavy loss by the death, on September 24th, of Professor A. G. Gilbert, of the Agricultural Experiment Station, Ottawa. As a pioneer in the Dominion he had an uphill fight, not only to obtain recognition on the part of those in authority to the possibilities of poultry developments, in which direction he succeeded admirably by force of character, definiteness of aim, and determination, but also he was able to impress his views upon producers even to the far west, equally by his advocacy of better methods and demonstration through his experi-

mental work at Ottawa. Some of the latter were very valuable indeed. One fact should be mentioned in this connection, namely, his influence upon younger men taking up the same work. We have been much impressed by this fact, which speaks volumes. Truly it may be said that "though dead he yet speaketh."

It was only in April last that Professor Gilbert was appointed to the position of Chief Advisor to the Poultry Department of the Dominion, in which it was hoped there were many years of service to be rendered. In announcing this appointment the *Canadian Poultry Review* said:

"Mr. Gilbert has been to the forefront in poultry circles for many years. He has borne the heat and burden of the day; he is a pioneer who has blazed the trail for other instructors who have benefitted by his experience and work. He now takes the place of Chief Advisor to the Poultry Department of the Dominion, and we hope may be spared many years to see the full fruition of that work that is so dear to his heart."

Such hopes have not been realised, but the growing development of the poultry industry will be a monument to his labours.

HARPER ADAMS AGRICULTURAL COLLEGE, NEWPORT, SALOP.

Poultry Laying Competition, 1912-13.

The following are the first twenty pens in order of merit, subject to final revision, of the final results of the Twelve Month's Laying Competition:—

Order.	Pen. No.	Breed	Final Month Eggs.	Value. s. d.	Total for year, Eggs.	Value. £ s. d.
1	60	White Wyandottes	105	12 10 ³ / ₄	1339	7 3 3 ¹ / ₂
2	86	Buff Rocks	71	8 9	1207	6 7 2
3	32	White Wyandottes	72	8 10 ¹ / ₄	1276	6 5 9
4	29	" "	100	12 2	1251	5 18 8 ¹ / ₂
5	35	" "	57	6 11 ¹ / ₂	1123	5 9 3 ³ / ₄
6	45	" "	60	7 3 ³ / ₄	1101	5 3 11 ¹ / ₄
7	11	" Leghorns	75	9 1 ¹ / ₄	1142	5 8 2 ³ / ₄
8	24	Black "	29	3 6	1077	5 6 4 ¹ / ₄
9	22	White "	49	5 11	1089	5 6 0 ¹ / ₂
10	53	" Wyandottes	68	7 2 ³ / ₄	1139	5 5 1 ¹ / ₄
11	52	" "	45	5 5 ³ / ₄	1093	5 4 3 ³ / ₄
12	54	" "	39	4 9	1077	5 1 7
13	20	" Leghorns	45	5 4 ¹ / ₂	1039	5 0 4 ¹ / ₄
14	95	Rhode Island Reds	57	7 0	1077	5 0 3 ³ / ₄
15	7	White Leghorns	48	5 10 ¹ / ₄	1032	5 0 3
16	80	Buff Orpingtons	29	3 7 ¹ / ₄	1009	4 19 8 ³ / ₄
17	10	White Leghorns	52	6 4	997	4 19 8 ³ / ₄
18	40	" Wyandottes	35	4 2 ¹ / ₂	1000	4 19 3 ¹ / ₄
19	31	" "	92	11 2	1005	4 17 3 ¹ / ₄
20	49	" "	73	8 10 ³ / ₄	1039	4 17 3 ¹ / ₄

A full report and awards will be published in due course, and the report will give full details of housing, feeding, management, &c.

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12 " " "	8d.
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50 " " "	1/6
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ALL-BRITISH MATERIALS



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A Special Design is made
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*Awarded Silver Medal at Festival
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Prices & full Particulars free from
The Stanley Underwood, Co.
Shottermill,
HASLEMERE, SURREY.

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All kinds of American
poultry, pigeons
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This record was attained by birds that produced some of my present stock.

Many thousand prizes won all over the World with stock exported from these yards whilst my ORPINGTONS for five successive years have held A LEAD AT THE DAIRY, PALACE or CLUB SHOWS besides leading in America, South Africa and on the Continent.

A magnificent lot of large heavy exquisite coloured birds for sale.

Antique Furniture and Curios of all kinds also
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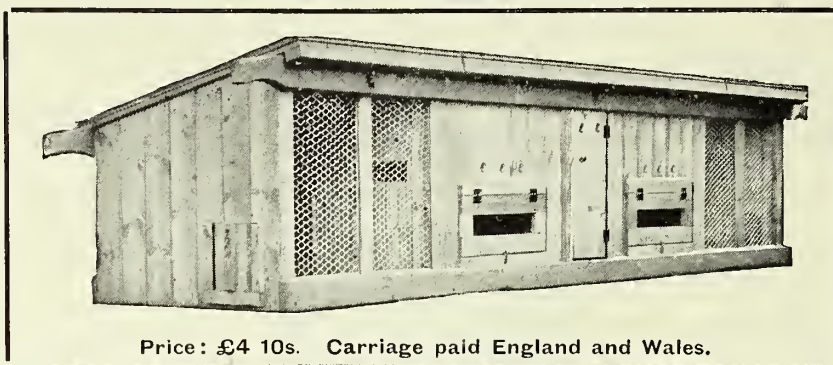
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Labour bill halved.

Absolutely storm-proof.

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Price: £4 10s. Carriage paid England and Wales.

Lamp fumes amongst chicks impossible.

Thorough study made of ventilation.

Copper tank throughout, which can be removed bodily in a few seconds.

Day old chicks and month old

IN SAME MACHINE.

**The most practical and reliable rearer on the market combining utility with economy.
The very best material and workmanship.**

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from Mr. F. H. Wheeler, Bridge House, Marden. I am very pleased to inform you that so far I have had excellent results from your Brooders, can you send me one at once for delivery by Thursday next.

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full grown 7/6 each

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Ditto, from our trap-nested hens averaging 187 eggs 10/6 to 21/-.

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Pen 1—Contains 1912 own trap-nested birds, averaging 200 eggs, sittings, 21/-.

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Pen 3—Ditto, averaging 176 eggs " 7/6.

Mated to 1913 cockerels from own trap-nested 261 egg hen.

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Pen 2—1st cross Indian Game-speckled Sussex—white Orpington hens.

Pen 3—Ditto, speckled Sussex hens.

Pen 4—White Orpington cockerel—1st cross Orpington-Sussex hens.

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Sittings 15 eggs or 12 eggs and unfertiles replaced once if returned within 14 days.

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CAM'S DREADNOUGHTS.—My four White Leghorn Pullets laid 324 eggs in 16 weeks and have proved themselves to be World's Champion Winter Layers. My strains of White Leghorns, White Wyandottes, and Buff Orpingtons have won more prizes in the last four years' laying competitions than any two Firms, proof of honest dealing. I can now spare few breeding pens of 1910-11 hatched birds. Now is your chance to get England's best layers. 1912 Cockerels ready 10/6 to 25/- each. Lists free.—Apply E. CAM, The Glen Poultry Farm, Hoghton, near Preston.

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Can supply February and March hatched 1913 Pullets of the following breeds.

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